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Railway Age

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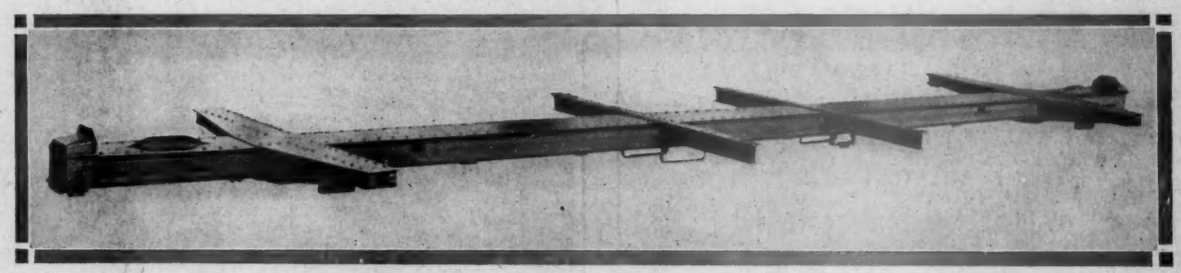

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EDITORIAL

Railway Age

The *Railway Age* does not care at this time, at least, to enter into a discussion of the political aspects of the recent decision of the Paris peace conference whereby the former German rights in the Chinese province of Shantung are to be transferred to Japan. It does believe, however, that the decision is of far-reaching importance from many points of view. By the agreement made, to quote from the Associated Press despatch, "Japan voluntarily engages to hand back Shantung province in full sovereignty to China, retaining only the economic privileges granted Germany, and the right to establish a settlement at Tsingtao, south of Kiaochau." That the economic privileges mentioned are great is generally understood. That they will help Japan in its efforts to secure access to one of the greatest coal fields in the world is not so generally known. The *Railway Age,* therefore, feels itself somewhat fortunate in being able to present to its readers the article on another page by Frank Rhea, which clearly outlines the salient facts in the situation, from the railroad and transportation standpoint. In his article, Mr. Rhea has purposely omitted all reference to the controversial and speaks only from the point of view of an engineer who has visited the country in question and has studied it first hand.

Japan's Rights in Shantung

The standard contract between the government and the railways lays the burden of paying expenses accrued prior to the assumption of government control upon the railroad corporation. In like manner, when the roads are turned back to their owners, the accrued but unpaid expenses of the properties under the Railroad Administration will have to be paid for by the government. These accrued expenses cannot be taken into the accounts until they are known. Practice among different roads has varied and the amount of liability for accrued expenses that have not gotten into the accounts is greater proportionally on some roads than on others. This amount cannot be reflected in the balance sheet. For instance, no liability is shown in the balance sheet for a claim for loss and damage until the amount of such claim has been determined. There is a total of such unaudited accounts much larger than most people realize. For instance, the income deductions account of the Chicago, Milwaukee & St. Paul, *Railway Age,* April 18, 1919, page 1026, shows that the expenses prior to January 1, 1918, credited in account with the Railroad Administration amounted to $5,583,965. Ordinarily, of course, these expenses are simply carried into the next year's accounts and since each year bears corresponding expenses for the previous year, the accounts fairly correctly represent a 12 months' expenditure, but when the accounts are cut off, as they were as of January 1, 1918, there slowly come in items which the corporations have had to pay out of their own funds and it must be remembered that the government took over the cash as well as other working assets. These bills have had to be paid, therefore, either through borrowed money or from rental received from the government or from other corporate sources of income. There is, however, the reverse side to this situation. When the roads are turned back to their owners there will be a corresponding total of items coming in to the government to be paid by the government, which would not be reflected in the balance sheet if one were to be drawn up today for the United States Railroad Administration. This is a factor which should not be forgotten in making an estimate of what funds are required for working capital, payment of rental, etc., by the Administration. Indeterminate as it is, it must be reckoned in some way in the cost of government operation and allowed for in Congress appropriations.

A Sometime Forgotten Item

The "cost-plus" form of contract was in many ways a desirable instrument for the award of railway construction work under the uncertainties of war times. Inability to predict basic costs even a short time in advance made the unit price or lump sum contract undesirable, since the bidders had to make their tenders high enough to cover the maximum unfavorable conditions and the highest possible cost of materials and labor. Now, during the period of readjustment, conditions are subject to nearly as much uncertainty as during the war. Owing to the apparent failure of the price stabilizing plans and the fact that the prices of certain classes of labor are still subject to the laws of supply and demand, no one can predict with any accuracy what work will cost two months hence. Therefore, the form of agreement which will protect the contractor against rising costs, yet will allow the owner to take advantage of any reductions in the prices of materials and labor, would seem highly desirable from many aspects. The one basic objection to this arrangement lies in the lack of incentive for efficiency under the cost-plus contract. One contractor doing work on a unit price basis is now paying as low as 30 cents for common labor, thus obtaining a neat margin over a bid made last fall under much less favorable circumstances. The question arises whether he would have taken the trouble to secure labor at this low rate if it had not been to his pecuniary advantage to do so. However, even this objection would not seem to justify the use of the unit price or lump sum forms of contract under present conditions for any except the small jobs to be undertaken immediately and completed within a few weeks' time. Work of this kind does not involve the uncertainties inherent in the larger projects of railway construction.

"Cost Plus" in Railway Construction

Savings Due to Interlocking Plants

A STUDY OF THE ECONOMIES effected by the installation of interlocking plants made in 1905 showed that 45 cents was a conservative figure for average cost of stopping a train. It was also found that when from 16 to 19 trains a day had to stop at a crossing the annual saving offset the annual charges (interest, depreciation, maintenance and operation) against interlockings of a certain size. At drawbridges, where it was assumed no additional men were needed, the same thing was true, with a daily traffic of 7 or 8 trains. If more trains were operated, interlocking at such points would more than offset the charges against it. The cost of materials has steadily climbed since this investigation was conducted,and while this would increase the cost of a plant, the cost of stopping trains has also undoubtedly increased in an equal or greater proportion, so that the above ratio should hold good at present.

When railroad traffic is heavy the officers have little or no

opportunity to plan or put into effect certain economies, but during periods when less active business prevails, an opportunity exists to carry on such studies. Where savings can be made those of an intangible nature are usually the last to be considered, even though they would in the aggregate amount to large sums yearly. An interlocking plant usually reduces the cost of operation, but the saving is to a large extent of an intangible nature. Not only do plants eliminate the cost of stopping trains, but their installation may permit of the hauling of heavier tonnage because of the elimination of stops. Other items to be considered are the prevention of damage in starting heavy trains, the increased safety of operation, the reduction of time on the road and the general improvement in train movement.

As an example, the studies made in 1905 by J. A. Peabody, signal engineer, Chicago & North Western, show a net saving of $2,300 a year effected by the installation of an interlocking plant at a point where two single-track roads cross, with a total of 30 trains a day on both roads. The time required to pay for the installation from these net savings, neglecting all other factors, is three years. Twenty like places interlocked on a system meant a saving of $46,000 per year at that time. A proportionate saving would result at the present time, as was brought out in an article by C. C. Anthony, published in the *Railway Age* last week. Railroad officers may well afford to have similar studies made at the present time covering points on their systems not now interlocked, such as grade crossings, drawbridges, entrances to yards, crossover locations, etc., looking to the construction of plants as soon as conditions warrant.

Can Electrification Meet All Future Requirements?

THE RAILROAD MEN who are responsible for keeping the railroads operating on a sound basis are of a necessity hard-headed. They have had the advantages of electrification presented to them in such glowing colors for so long by enthusiastic promoters of electrification that they are not prone to recognize its merits when presented to them fairly. They know that general electrification would conserve a vast amount of the nation's coal, that electric locomotives are capable of high sustained drawbar pull at comparatively high speeds, that electrification increases track capacity and has numerous other advantages. They also know that the first cost of electrification is very large, that it requires more or less complicated overhead systems, that it means a necessary departure from established methods of operation and that existing conditions in a territory under consideration for electrification are the deciding factor for or against its adoption.

It is difficult to frame a convincing argument showing that electric operation improves service and reduces the cost per ton-mile of hauling freight. It can be done, however, and railroad men know that the amount of electric operation is bound to increase. For this reason they are interested in the specific problems involved. For example: Is there to be a continuous increase in the weight and length of trains as there has been in the past? What is to limit the capacity that can be hauled? Is it the length of the train, or the weight, or the power requirements or some other factor? What is the economic speed for passenger and for freight work? What requirements will be made of electric locomotives which are not inherent in their operation? Is it necessary to provide for moving fleets of freight trains or can they be scattered through the day to give a load factor on the line which can be handled without prohibitive expense? These are questions which vitally affect the economy of electrification. The inherent characteristics of steam and electric locomotives will largely determine which shall be used to meet future problems, and for this reason the abstract in this issue of the paper presented by W. R. Potter and S. T. Dodd at a recent meeting of the Western Railway Club is of timely interest.

Government Guarantees to Railroads

UPON MOST OF THE IMPORTANT QUESTIONS regarding the legislation under which the railways should be returned to private operation there is now substantial agreement among those who have given long and earnest study to the railroad problem, and who are in favor of a return to private operation. But the most important question involved is that of what means shall be adopted to restore and maintain the credit of the railway companies so that they shall become able adequately to develop their facilities; and upon this really vital question there is serious disagreement.

The difference of opinion is chiefly over whether the companies shall be given guarantees of net operating income by the government. Government guarantees are advocated by persons who have widely different reasons for doing so. They are advocated by Senator Cummins, who will be chairman of the Senate Committee on Interstate Commerce, on the ground that they would reduce the capital charge and thereby effect a saving in the cost of transportation. In an editorial in our issue for April 25, page 1031, we presented our reasons for believing that the effect of government guarantees to individual companies would be to increase rather than reduce the total cost of transportation.

Government guarantees are also being advocated by some of the leading financiers of the country, including Paul M. Warburg. Director General Hines also favors them. Most of the financiers who advocate them do so because they fear that in the absence of guarantees the regulating authorities can never be prevailed upon to make the net return earned by the railways large and sure enough to attract adequate capital.

Those who take this position have the strong argument of experience on their side. The system of regulation which prevailed during the 11 years before government control was adopted was a failure chiefly because the federal and state regulating authorities would not let the railways earn enough net return. The State authorities were the greatest offenders, but the Interstate Commerce Commission was far from guiltless. Most of those who favor guaranteeing the railway companies minimum returns also propose that those which earn more than the guarantee shall be allowed to retain part of the excess as an incentive to efficiency, the rest to go partly to the government and partly to labor.

The plan of giving guarantees to individual companies, whether upon the basis of valuation or any other basis, is opposed by most of the shippers of the country. It is opposed by many leading financiers, including Otto H. Kahn. It is also opposed by a majority of the railway executives, and especially by those who represent relatively prosperous roads. One very strong argument against it was presented by Samuel Rea, president of the Pennsylvania Railroad Company, in his address before the Chamber of Commerce of the United States last week, which is published elsewhere in this issue. The principal point made against government guarantees is that they would impair the incentive to efficient management. Another point is that if some of the railways failed to earn their guarantees and the government had to make them good from the public treasury, there would result controversy and agitation which probably would lead to government ownership.

The *Railway Age* has never had any doubt as to the general policy which would most effectively further the welfare of both the railways and the public, if it could be adopted. The

best policy would be, to let the railways make all consolidations and agreements which will not prevent competition in service and emulation in operating efficiency, and earn as a whole, a net return sufficient to attract adequate capital without guaranteeing a minimum to any individual road. Perhaps legislation and a system of administration can be secured under which this will be done. The principal shortcomings of the old policy of regulation were due to the following causes: First, the Interstate Commerce Act required the Interstate Commerce Commission to fix "reasonable" rates, but did not specifically make it the commission's duty to fix rates which would enable the railways to earn a return adequate to develop their facilities. Second, the commission as now constituted was created and its members were appointed at a time when the public believed that the sole function of regulation was to punish and control the railways and not to help them. Third, regulation by the Federal Government was constantly interfered with by that of the States. In consequence of these things, most of the members of the Interstate Commerce Commission during the last 13 years have regarded the railway companies with chronic suspicion and hostility, and even when the commission has shown a disposition to give the roads adequate rates its work has been interfered with by the State commissions and denounced in Congress. Bills have been introduced to abolish it, the real purpose of which was to prevent it from granting needed advances in rates.

It may be that regulation would be given a very different tone and tendency if the Interstate Commerce Commission were by express legislative enactment required, first, to prevent any interference by the States with Federal regulation of interstate commerce, and, second, to make rates not only reasonable in their relations to each other, but adequate to enable the railway companies to develop their facilities sufficiently. But whether this would be enough to solve the problem of regulation is very doubtful. Some members of the commission have within recent months publicly contended that it did let the railways earn an adequate return. Not much can be hoped from men who cannot see facts that are as plain as a pikestaff.

Many persons have criticised the plan of regulation put forward by the Association of Railway Executives because it proposes to transfer most of the administrative functions of the Interstate Commerce Commission to a Secretary of Transportation. But the railway executives do not ask for any government guarantees, and their proposal that a large part of the authority and duties of the commission shall be transferred to a Secretary of Transportation, is merely their way of saying that in the absence of guarantees they would fear to leave their case entirely in the hands of the commission. And they are amply justified in this position. It is clear that if private operation is to be made a success at all, either the railway companies must be given government guarantees, or the Interstate Commerce Commission must be so reconstituted as to render certain that the policy followed by it in regulating rates in future will be widely different from that followed in the past; or a large part of the administrative functions of the commission must be transferred to some other official or body. In the absence of guarantees, rate cases must in future be decided more promptly; intelligent cognizance must be taken not merely of existing conditions, but of prevailing tendencies; and the rates allowed must be adapted not to restrict the railways to the so-called "fair return upon the fair value of their properties," but to provide them with revenues ample to enable them to give good service and to expand their facilities. It may be, as those who oppose specific guarantees contend, that the guarantee policy would soon land us in government ownership. But it is even more certain that if guarantees are not given and the policy of regulation of rates formerly followed is restored we shall soon be forced into government ownership.

Delaware & Hudson

ONLY WHEN THE GOVERNMENT began to have to cast about for ways and means of raising the money to operate the railroads did any considerable number of people discuss the railroad problem, not as an effort to find ways of surpressing a predatory power, but as a question of how the transportation system of the country can be continued in its development and be best operated. When men like Samuel Rea, Daniel Willard, Frank Trumbull and Julius Kruttschnitt went to Washington and confessed frankly that they did not know where the money was to come from for the continued development of the roads, the great majority of the public was skeptical and somewhat amused. Had these gentlemen tried fully to express the acuteness of the fear with which they viewed the situation, it would have but laid them open to the ridicule of the Clifford Thorne's and the Hearst papers.

The railroad men and some of the bankers knew how affairs were actually shaping themselves. L. F. Loree, president of the Delaware & Hudson, and a close friend and associate of the late E. H. Harriman, made the remark, at the time of Mr. Harriman's death, that he, Harriman, saw as clearly as any pessimist of them all what the course of events was leading to, but that he differed from his associates in that he had such entire confidence in his own ability to meet the situation that he viewed it without apprehension. Whatever particular form the solution of the present railroad problem may take, the first essential in devising the solution is a thorough understanding of the problem itself. Thoughtful students of public affairs more and more often have been been asking where the money is to come from to continue the development of American railroads.

The Interstate Commerce Commission tried in a theoretical bookkeepingish way to draw a hard and fast line between operating expenses and capital expenditures. The stronger railroad companies, with far-sighted and wise managements, at first protested the definition of expenses, and then frankly took the attitude that the commission could define expenses as it pleased; they, however, would continue to put into the property great sums of money over and above what the commission defined as maintenance and to issue securities against only a part of such so-called capital expenditures. Had earnings been sufficient to permit of such a course, the railroad managements which adopted it would have had a good prospect of success.

The factors involved in the development of an American railroad are different than the factors involved in the continued operation of railroads in Great Britain or in continental Europe. The Interstate Commerce Commission's theory of accounting might have been applicable to the Prussian State Railways. It was probably influenced by German practice, and nothing could demonstrate more clearly the fact that the commission had not the faintest comprehension of the fundamentals of the industry which it so confidently set out to regulate. That it was lack of comprehension and nothing politically immoral that swayed the commission goes without saying. There has never at any time been the slightest question of the integrity of the commission.

The development of an American railroad makes a tremendously interesting study. Concealed or revealed, dependent on the reader, in the masses of statistics reported to the commission and to stockholders, there is a wealth of incidents worthy of as much interest as the history of a country or the life of a great statesman. Seldom, if ever, has such a story been written in a language intelligible to the average reader. L. F. Loree, in his annual report to the stockholders of the Delaware & Hudson, has undertaken to do this very thing. The road is being operated by the government, and Mr. Loree, therefore, dismisses quite briefly the

year's operations and devotes himself instead to a discussion of the development of the property from 1907, when the new management took hold of it, to the time it was turned over to the government. This story of the Delaware & Hudson, rightly and fully comprehended, gives the essentials of the railroad problem. Could it have been read and understood by each interstate commerce commissioner, there would have been no need for long drawn-out rate cases. The Delaware & Hudson report is not easy reading, notwithstanding the fact that statistics are avoided and figures are used very sparingly. It is both tersely and intensively written; facts are stated often without comment; conclusions are arrived at by the writer only after they have become inevitable to the reader.

In Poor's Manual for 1872-73, in the description of the Delaware & Hudson Canal Company, which controlled the Delaware & Hudson canal and the Delaware & Hudson railroad, the following occurs: "The company derive their income mainly from the mining, transportation and sale of anthracite coal, conveyed to market over their own works. The incidental traffic is very limited, and brings no net profits into the treasury. For several years the company's stock has received dividends, February and August, each of 5 per cent." As a matter of fact, although the Delaware & Hudson, as Mr. Loree points out, is one of the oldest railroad companies in the United States, and "was the first to operate a steam locomotive on the American continent," it was formerly an adjunct to coal operations rather than a machine depending entirely on its earning power as a common carrier to reimburse its owners and creditors.

Prior to 1907, however, a considerable expansion of purely transportation facilities had taken place and the former management had gotten the company into a rather difficult situation, partly through the purchase of unprofitable electric lines and partly through lack of sufficient forethought and courage in the development of the railroad property and the financing thereof. When, therefore, the new management took hold in 1907 it had to deal with nearly all of the important elements of the problem which has faced American railroad men. The management has been eminently successful and turned over to the use of the government a thoroughly modern and up-to-date American railroad property. The success of the Delaware & Hudson has, we believe, been in part due to the strength which the coal department of the company lent to its credit and, in remaining part, to the skilful use of this credit by the management in the development of the machine as a transportation machine. Again and again, in Mr. Loree's story, we come across the evidences of the studied development of a plan as a whole, of which the purchase of Mallet locomotives, the building of the Oneonta yard, grade reduction, etc., are only parts, each carried out in co-ordination with other parts of the general plan. It is the extraordinary sureness and nicety of fit of the parts that has contributed so much to the success of the Delaware & Hudson.

The rental which the company should get under the standard contract is $7,415,000, and after taking into its income account other corporate income and after the payment of war taxes, rentals and interest, the company had $4,715,000 available for dividends, or an amount equal to 11.09 per cent on its stock. The Delaware & Hudson is paying dividends at the rate of 9 per cent annually.

Ordinarily, the annual report of the company includes details of operating expenses and statistics of operation, but this year these details are omitted, although the figures will later become available through reports to the Interstate Commerce Commission. It seemed best, therefore, to leave an analysis of the operation of the property, by the federal manager in the employ of the government, until next week, or such time as the detailed figures are available, and to confine these comments to the historical sketch of the development of the property from 1907 to 1918, which is contained in the report to stockholders, and the greater part of which is reprinted elsewhere in this issue of the *Railway Age*. It is a document which is worthy of the most careful study by all those who are now engaged in discussing the future of the railroads. Different phases of history have, from time to time, brought out some supremely comprehensive and searching narrative and analysis of the events, and occasionally a phase of history, an economic development, or the career of a statesman, calls forth a classic in the shape of a history, an essay or a biography. This report of Mr. Loree's, confined as it is to the history of one railroad company, the Delaware & Hudson, is, nevertheless, such a classic dealing with the history of American railroads in the last decade.

The Railroads—A Bankrupt Industry

THE DEFICIT INCURRED by the Railroad Administration not only continues to grow, but grows faster than even the most pessimistic have feared. It was $58,000,000 in March. This made the total deficit for the first three months of the year approximately $130,000,000, or almost one and a half million dollars a day. The government's guarantees of standard return to the companies, in these three months, based upon the net operating income which the companies had formerly earned in those months, were $170,000,000. The net operating income actually made was only $40,000,000, or but 23 per cent of the guarantees.

These startling figures ought to raise in the minds, not only of everybody directly concerned with railway operation, but also in the minds of public men and the public, the question of what is the matter with the railways?

The *Railway Age* has said repeatedly within recent weeks that if the wages now being paid are to be continued passenger and freight rates must be substantially advanced or the railways will be unable to earn the guaranteed standard return under Government operation or to earn sufficient net operating income under private operation to save the railway companies from general bankruptcy. Director General Hines, on his recent trip to the Pacific coast, made a number of addresses and public statements. He appears to have attributed the current bad showing of earnings and expenses chiefly to the heavy decline of traffic. He indicated that in his opinion the results will improve when industrial and transportation conditions become normal. He implied that until then no advance in rates will be made, and apparently left the impression that probably little or no advance in rates may be necessary.

Let us consider the director general's attitude in the light of the facts. It is true there has been a decline of traffic; and some refer to the business which has been handled thus far this year as abnormally small. It is smaller than that of 1918 or 1917; but conditions in 1917 and 1918 were not normal, and the traffic handled in those years showed a vast increase largely due to war conditions. Let us go back to the first three months of 1916. In that year the railways had the largest increase of traffic that ever occurred in any single year. They made the largest operating income ever made in one year. Every one remembers this. Doubtless, consequently, most people assume that because of the recent decline in traffic the business which has been moved thus far this year has been much less than in the remarkable year 1916. It is somewhat disconcerting, therefore, to find that in the first three months of 1919 the freight traffic of the railways was 85,000,000,000 ton-miles, while in the first three months of 1916 it was only 80,000,000,000 ton-miles, an increase in 1919 over 1916 of over 6 per cent. Furthermore, the traffic handled in the first three months of this year

was only 10 per cent less than that moved in the corresponding three months of 1917 and 1918. The railways moved less freight in February and March of this year than in the same months of 1917 and 1918, but they moved more in January than in either of those years.

Bearing in mind that the freight traffic moved in the first three months of the year was 6 per cent greater than in the same three months of 1916, let us compare the earnings made and the expenses incurred. The total earnings in these three months in 1916 were $811,000,000, while in 1919 they were $1,120,500,000, an increase of 38 per cent. The operating expenses in 1916 were $560,000,000, while in 1919 they were $1,037,000,000, an increase of 85 per cent. In the first three months of 1916 the ratio of operating expenses to total earnings was 69 per cent. In 1919, with passenger rates 50 per cent higher, and freight rates close to 35 per cent higher, the ratio of operating expenses to total earnings was 93 per cent. In the first three months of 1916 the railways, after paying their expenses and taxes, had left $214,000,000 of operating income. In the first three months of 1919 they had operating income (which is slightly larger than *net* operating income) amounting to only $44,000,000, a decline as compared with 1916 of 79½ per cent.

It is easy enough for anybody who carefully examines the foregoing figures to see what is the main trouble with the railroads. It is not the decline of traffic, but the increase of expenses. The increase of expenses seems especially startling when it is considered that the weather conditions for this period were abnormally favorable to economical operation.

Mr. Hines seems to look forward confidently to a revival of business which will stop the decline in traffic. Doubtless that will come. But that it will come soon enough or be large enough to prevent the loss of traffic during the year from being relatively as large throughout 1919 as it was during the first three months—that is 10 per cent—there seems no good reason for believing. If the loss of traffic throughout the year should be relatively as large as it was during the first three months, and railroad expenses should continue to be relatively as large, the railroad deficit for the year would be not far from three-fourths of a billion dollars.

Mr. Hines is also counting upon a substantial reduction of expenses. But the progress which had been made up to the end of March does not inspire hope. In January, when there was an increase of 10 per cent in the freight moved, the increase in operating expenses, compared with the same month of 1918 was 32 per cent. In February, when the decline in freight traffic was 13 per cent, the increase in expenses was 24 per cent. In March, when the decline of freight traffic was 23 per cent, the increase in expenses was 22 per cent. Whether the business moved increased or decreased, the large increase in expenses went on.

We can draw only one inference from these three months' statistics, or, for that matter, from the statistics regarding the six months of operation following the signing of the armistice. This is, that no increase of traffic, or increase in efficiency of operation, or increase in both, which there is the slightest possibility will occur, would leave the railways anything but a hopelessly bankrupt industry, if existing wages and existing rates were retained.

The fact cannot be too strongly emphasized that, from the standpoint of its earnings and expenses, the railroad system of the United States is today absolutely bankrupt. It is earning only 23 per cent as much net operating income as in the three years ended with June 30, 1917, in spite of the fact that its gross earnings are running about 50 per cent more than they averaged in those years. The rates must be advanced, and substantially advanced, if the railroads are ever to be converted from a bankrupt into a prosperous industry, and this whether government operation is continued or private operation is restored.

Letters to the Editor

The Lessons of the Past for Guidance in the Duties of the Present

St. Johns, Que.

To the Editor:

The educational value of your paper for young trainmasters and division superintendents is a fact often remarked in railroad circles and, of course, does not need to be proved by any specific declaration in your columns. Like the Washington monument on the banks of the Potomac, or the Statue of Liberty in New York harbor, it is as patent, to those who look, as is the monumental building in which you frame up your useful lessons for ambitious readers. But even those massive monuments are to most of us rather dim, because ordinarily we are too distant to take in all of their details; and the teachings of the Railway Age in like manner often suffer from our inability to focus attention on specific points. You will be pleased therefore, to hear of a definite item in this field of knowledge and of railroad science. In publishing your lucid and searching accounts of the shocking collision near Nashville, Tenn., last summer, you contributed toward the prevention of a similar catastrophe on another road. Two passenger trains were running in opposite directions toward each other and one of them was prevented from proceeding beyond the meeting point (through the forgetfulness of all hands) only by the presence of the trainmaster on the train, who called the negligent men to their senses.

Train No. 3 was proceeding westward, from a point which we will call Boston, toward "Chicago," which was the end of double track. Thence, on the single track line, the distance was 9 miles to Washington and thence 15 miles to Waterloo. About half a mile before reaching Chicago, the trainmaster observed that they were meeting train No. 2; No. 2 being superior to No. 3 by direction, and both first class passenger trains. He observed also that No. 2 displayed green signals, yet did not sound the whistle to call the signals to the attention of the men on No. 3. No. 3 had a car to set off at Chicago; so the trainmaster had some little conversation there with the engineman and fireman.

After the engine had backed on to the train and the conductor had shouted "All aboard" and it was plain that no thought had been given to the second section of No. 2, the trainmaster said to the engineman "Where are you going?" The engineman replied "Why, what's the matter?"

"What have you got on No. 2?" said the trainmaster. The engineman then replied that No. 2 had gone. On being told that it carried green signals he declared otherwise; and he said to his fireman, "Did No. 2 have signals?" The fireman replied that it did. Then the trainmaster, telling the engineman to remain at a standstill, went back and asked the conductor what he had on second No. 2. The conductor replied that he had nothing; and he did not know that No. 2 was carrying signals.

The point of this story is that the trainmaster, in relating the particulars to my informant, said that he had been reading about the Nashville collision; and he had the facts of that disaster in his mind. The engineman of first No. 2 failed to sound the whistle. The fireman of train No. 3 failed to speak to the engineman when he saw the green flags. The conductor of No. 3 failed to make any inquiry at the end of double track (there is no train register at this point). Thus four men "fell down"; and who knows whether the trainmaster would not also have fallen down if he had not been a regular reader of the Railway Age? K. & Q. C.

Chamber of Commerce Discusses Railroad Situation

Suggestions for Permanent Solution of the Problem a Feature of St. Louis Convention

WITH ONE OF THE SIX general sessions and a group meeting devoted exclusively to the railroad problem and its solution, discussion of the present transportation situation developed into one of the features of the seventh annual meeting of the Chamber of Commerce of the United States which was held at St. Louis, Mo., April 28 to May 1 inclusive. The feature of this convention of most interest to railway men was the general session, held on the evening of April 30, at which Walker D. Hines, director general of railroads, Senator Albert B. Cummins of Iowa and Samuel Rea, president of the Pennsylvania spoke in the order named. The preceding day a group meeting, presided over by George A. Post, chairman of the railroad committee of the Chamber of Commerce of the United States, was devoted to the subject of railroad transportation. At the same time the railroad problem and the relation of the present situation to the general state of business, entered into the discussion in several other group meetings, especially in one devoted to wholesale domestic distribution at which Luther M. Walter, counsel for the National Association of Owners of Railroad Securities delivered an address on "The Desirability of the Return of Railroads to Private Ownership" and M. J. Sanders, federal manager of the Mississippi-Warrior Waterways at New Orleans, La., spoke on "The Importance of Co-ordination of Rail and Inland Waterway Transportation."

An outstanding feature of the general session devoted to the discussion of the railroad problem, at which Director General Walker D. Hines, Senator Albert B. Cummins and Samuel Rea spoke, was the similarity of the solutions presented by Mr. Hines and Senator Cummins. The solution offered by the former was in substance the same as that outlined before the National Lumber Manufacturer's Association in convention at Chicago, an abstract of which was published in the *Railway Age* of April 18, with the exception that in this case Mr. Hines immediately delved into the solution of the present problem and went into detail as to the disadvantages of the present and past systems and the advantages of the solution he proposed. Senator Cummins in turn presented his solution, outlining practically step by step the same principles advocated by the director general. Senator Cummins' solution of this problem is essentially the same as that outlined in his address delivered on March 27, before the general assembly of Iowa which was reproduced in the *Railway Age* of April 25, page 1041.

Address by Honorable W. D. Hines

Director General Hines said in part:

I want to tell you that my own judgment, based on a very careful study of this subject since the federal control began, is that the best interests of the country will be promoted, not through permanent government control of the railroads but through the return of the railroads to private management. It is also highly desirable to have a permanent solution at the earliest possible time, so that this return may take place without unreasonable delay, but so that it will not be necessary to take place until a permanent solution shall have been adopted. I think at times the disposition to want a very early return to private management has obscured the appreciation of the necessity for thoroughgoing legislative reform before that return takes place.

Viewing railroad regulation from the standpoint of the private management and the public standpoint, I have undertaken to make a diagnosis of the trouble which seemed to manifest itself in the sort of regulation which we have had in the past. I think there is general agreement that the regulation was not satisfactory. It seemed to me as the years went by the regulation was increasingly unsatisfactory from the public standpoint, and that from time to time there was increasing unrest with the conclusions which were reached by the regulating bodies.

Undoubtedly the regulation was unsatisfactory from the standpoint of the capital invested in the railroads because the difficulty in attracting capital into the railroad business had become increasingly apparent. The condition had arisen for several years where it was almost impossible to sell railroad stocks, and the new money needed by the railroad had to be raised almost wholly by the creation of additional debt, so that the proportion of debt to total capitalization was rapidly increasing and the credit of the railroads was correspondingly diminished. Now based on my observation of this matter, first from the private management standpoint; secondly, from the public standpoint, I want to put before you my conception of the fundamental difficulties of the old form of regulations, because I think a clear appreciation of these difficulties will be the first step in arriving at a satisfactory remedy.

I would put first among the difficulties of the old form of regulations the fact that there was an entire absence of standards by which the regulation could be governed. There was a general concurrence of views that the railroads ought to have a fair return on the fair value of their property and no more, but nobody knew what the fair return ought to be; nobody knew what the fair value of the property ought to be, so it was unending debate all the time. We had a condition which in my opinion made successful regulation under the old conditions utterly impossible, and that is what I wish to mention as the second point in my catalog of fundamental difficulties with the old form of regulations. That second point is the wide disparity between the weak roads and the strong roads.

We had about 180 railroad companies in this country with revenue of a million dollars or more every year, and we had several hundred companies with operating revenues of less than a million dollars per year. That great number of companies presented every possible variation from a degree of exceptional prosperity to the degree of exceptional adversity, and yet every one of these railroads represented a necessary instrument of public service. Broadly speaking, the rates had to be the same for the weak roads as the strong; to a very large extent the scale of wages had to be the same regardless of the strength of the particular railroad because the cost of the supplies was practically the same for the weak and the strong. So we had a condition that whatever might be done through fixing the rates or through establishing a wage scale, the result was that some railroads would prosper while other railroads could not prosper at all, so that however any question of broad railroad importance was disposed the result led to discontent on the part of the public and to discontent on the part of the owners of the railroads.

There was another feature of regulation in the past which militated against a successful result: there was no point of contact in any effective sense between the government and the railroads. The government was permitting the railroads to exercise important public franchises, and the government was insisting very properly on the most thorough and far-

reaching regulation of what the railroads did, both as to the rates they charged and the service they rendered, and yet there was never any adequate provision for participtation by the government in what the railroads did, and the regulating body that represented the government was absolutely separate in its method of procedure and in the conduct of its business from the private management which represented the owners of the capital invested in the railroads. The railroad business, therefore, was conducted by two factors, each of vital importance, and yet those two factors were entirely aloof from each other. Each operated without adequate understanding of the point of view of the other; neither was in position to explain in a timely way its ideas to the other. That absence of any connecting link, the inability to have a common understanding of the necessity of the situation, was another reason why the regulation did not tranquilize the situation, but generally any definite step that was taken was simply the starting point for new agitation and new discontent.

Another point which was of very great importance was the persistent suspicion which was entertained by a very substantial part of the public and which was almost unanimously entertained by labor, that the railroads, or some of them, were heavily over-capitalized. Any argument that was made on behalf of the owners of the railroads against the institution of any given level of rates, or in opposition to any proposed increase in the level of expenses was disregarded by a considerable part of the public and by labor almost altogether because of this persistent belief that the railroads were over-capitalized.

Then again, and connected with that thought of over-capitalization, the public very generally believed that since the railroad business was a public business and could be conducted only by the exercise of important public franchises and since in its nature it was practically a monopoly, no matter how much competition in service there might be, it was of great importance that the public and labor should not be exploited for the benefit of the private capital. Plausible cause might be made for increase of the rates, and yet there was the fear that if the increased rates produced more than was absolutely necessary, or if conditions became more prosperous, so that there would be additional profit, that profit would inure wholly to the benefit of the private capital. There was no way in which the public could participate in it, and this fear of the public being exploited for the benefit of private capital was always tending to prevent a confidential and liberal treatment of the railroad question.

I would list those five propositions as the five fundamental evils of the railroad situation: first, the absence of standards; second, the wide disparity between the weak and the strong roads; third, the absence of any point of contact between the regulating body and the private management; fourth, the suspicion as to over-capitalization; and fifth, the fear that the public would be exploited for the benefit of the private capital.

Those difficulties I have mentioned were obvious before the war. They are very much more serious, and much more obvious now. The railroad situation in the future is going to be far more difficult than it was in the past. The disparity between the weak and the strong roads is going to be more pronounced; there are going to be fewer roads which can survive on the basis of their individual earnings. So whatever may have been the necessity for a radical and effective solution of these difficulties in the past, that necessity is multiplied many times by the new conditions which will confront the railroads of this country, and which have been the outgrowth of this war.

Simply as an illustration further to emphasize the point I have made, and to serve as a basis for discussion, I want to put before you my personal view as to a solution, and in all that I say I want to emphasize that I am speaking for myself alone.

This would be the solution which I personally believe ought to be adopted. I think there ought to be a compulsory consolidation of the railroads of this country into a few large competitive systems. I believe the American public wants competition in service, and I think that can be accomplished through the creation of a few large systems, say anywhere from 12 to 20. I believe in each of the three great sections of the country—the West, the East and the South—a few large railroad companies can be constituted each of which will be a strong system, and the several companies in each of these regions will give effective competition in service at practically every important point which now enjoys competition.

Each of these railroad systems can be made to combine the strong roads and the weak in such a way as to present a fair average in the general situation. In that way we will get entirely away from the insuperable difficulty in the past of trying to apply a single standard to railroads so different in their earning capacity that it was impossible for the same standard to work for all.

Since these railroad companies, reconstituted in this way, would have an official capitalization, that official capitalization would put an end for all times to come to this prevailing and persistent suspicion as to overcapitalization.

Having those railroad companies constituted in that way, with an official capitalization, I think the government ought to be business-like enough to save its own money and the money of the public by guaranteeing a moderate return on that capitalization, instead of by adopting a plan of giving an assurance which amounts to a sort of a moral guarantee, but yet is so uncertain as not to accomplish the result intended, either in attracting the new capital necessary, or in assuring an adequate public service. The government is morally bound, and as a practical matter it is bound, to keep the railroads in condition to render the public service, and if it cannot accomplish that in one way, it will have to accomplish it in another.

If you stopped there, you would wipe out the private initiative, which I think is of the utmost importance in order to get satisfactory public service, and in order to get a maximum of efficiency and economy, I would preserve that private initiative by giving private management a fair participation in the profits that might be earned in excess of this moderate guaranteed return. In that way the railroad management would get enough to stimulate private initiative just as effectively as it would be stimulated under any other system and at the same time the fact that there was a division of the profits, and perhaps, a rapidly ascending proportion of profits going to the government, or to the government and labor, would prevent the public and prevent labor from this suspicion and fear that it has always had that it would be seriously and detrimentally exploited for the benefit of private capital.

I believe that would result in removing the disposition toward illiberal treatment because I think that disposition has grown largely out of the fear, first of overcapitalization, and second, that there would be an unfortunate exploitation of the public for private benefit, if the rates were increased in a liberal manner, and I think this participation in the profits, along with the official classification, would guarantee that moderate return, and would get rid of all those difficulties.

I would go further than that. I would have the government represented on the boards of directors and I would have some of the government directors made members of the government regulating body, and in that way we would establish the necessary point of contact so that the private management in conducting this public business would do so with the advice and counsel of the representatives of the public, and so

that the regulating body, when it undertook to deal with this subject, would do so in the light of the knowledge acquired by members of its own body who were in daily contact with the management of the business.

Senator Cummins' Plans

Senator Cummins, after stating the supposition that President Wilson will retain the possession and continue in the operation of the railroads until Congress has had a fair opportunity to enact a permanent policy for their regulation and control and that Congress will proceed with the task and bring it to a conclusion within the next 12 months, concurred in the belief of the Director General that there must be a series of consolidations which will merge the weak roads with the strong ones to the end that the resulting systems may do business upon substantially even terms. Under this plan Senator Cummins would have the railways consolidated into 18 or 20 systems under the initiative and direction of the government.

However, these systems would not be regional systems; on the contrary, they would preserve competition in every part of the country and in practically every community. The second principle of the solution presented by Senator Cummins is that the government guarantee in some form a return upon the capital invested in railroads. In backing up these two principles of his plan, Senator Cummins cited the disparity in the net operating income of railroads operating in practically the same districts and the amount of return on the railway bonds of the country. The third phase involved in his solution advocated the operation of the railroads by private corporations rather than by the government. All three of these principles are the same as underly Director General Hines' proposed solution outlined above and the making of this solution a reality was indicated in the closing statements of Senator Cummins when he said that he planned to introduce a measure embodying these principles for the solution of the railroad problem in the early days of the coming Congress.

The address of Samuel Rea, president of the Pennsylvania Railroad Company, is published elsewhere in this issue.

Railroad Section Meeting

At the group meeting devoted to railroad transportation presided over by George A. Post, chairman of the railroad committee of the Chamber of Commerce of the United States there were presented the recommendations of that committee which were promulgated after four conferences with executives, financiers, legislators and labor leaders of the country. These recommendations will be presented to the various Chambers of Commerce throughout the United States for a referendum vote. These recommendations as presented were as follows:

1. Adherence to the policy of corporate ownership and operation of the railroads, under a comprehensive system of government regulation.
2. The return of the railroads to their owners as soon as remedial legislation can be enacted, and that no extension of the period of government operation should be made until Congress shall have found it impossible to enact the required legislation within the period possible under the Railroad Control Act.
3. That while adhering to the principle of railroad competition in service, the railroads be allowed, in the public interest, when so declared, and as approved by public authority, to consolidate to such extent and in such manner as may be necessary to enable the existing railroads to unite in a limited number of strong competing systems, so located that each of the principal traffic centers of the country shall, if possible, be served by more than one system.
4. That railroad companies engaging in interstate commerce shall be required to change from state to federal corporations, with suitable provisions in the Act of Congress providing therefor, that the several states shall retain the power of taxation and police regulation of the properties of said railroads.
5. That the Interstate Commerce Commission be authorized to pass upon the public necessity for expenditures of capital (in excess of a stipulated amount) by carriers engaged in interstate commerce, and to determine the amount and to regulate the other conditions of the issuance of securities to obtain the funds required to cover authorized capital expenditures. That a railroad applying to the Interstate Commerce Commission for authority to make capital expenditures, or to issue securities, shall be required to file with the proper authorities of the states in which the railroad is located copies of the original petition; and that the Federal Commission be required to notify the said authorities of the hearings upon the petition in order that they may advise the Federal Commission as to actions they favor.
6. That the Interstate Commerce Commission be given authority by statute to regulate intra-state rates, when those rates affect interstate commerce.
7. The enactment of a statutory rule providing that railroad rates and fares fixed by the Interstate Commerce Commission shall be such as will yield the railroad companies, in each of such traffic sections as shall be designated by the Commission, aggregate revenues which will provide (after provision has been made for renewals and depreciation) a net return upon a fair value (determined by public authority) of the property devoted to the public use. This net return should be sufficient in amount to enable the carriers to furnish the public with adequate facilities and efficient and economical services.
8. The enactment of a statutory rule of profit-sharing, whereby the railroad systems, having a net corporate income in excess of an equitable minimum return upon a fair value (determined by public authority) of their property devoted to the public service, shall be required to turn over a stipulated share of their excess profits to a fund to be employed, as Congress may direct, to strengthen the credit of the railroads as a whole and to enable them to serve the public with greater efficiency.
9. That a Federal Transportation Board be created, whose general duty it shall be to promote the development of a national system of rail, water and highway transportation, and thus to make possible the articulation and economical use of all the facilities, including tracks, terminals and transfer facilities, of steam and electric roads, waterways, and hard-surface highways.

Not only were these recommendations presented to those interested in railroad transportation present at the group meeting but the committee's reason for arriving at each conclusion was also presented. George A. Post, the chairman of the committee, in addressing the group, said in part:

The query for discussion in this section today is: What Shall Be Done With the Railroads? There are several things of importance to be considered in giving the answer, but it appears that *two things* ought to be done, which take precedence in any general statement, viz.: return the railroads to their owners just as soon as the necessary remedial legislation can be enacted by Congress, as preliminary thereto, and in doing so provide them with adequate revenue without which performance our country's commerce and industry must languish.

Before taking up for consideration the financial policy that must be adopted before the railroads may safely be returned to their owners, it may be of interest at this point to make a survey of some other phases of the plan for necessary remedial legislation which will demand the attention of Congress, and which will be useful to it as indicative of public opinion as it seems to have already taken form.

Federal regulation of all issues of securities of corporations engaged in Interstate Commerce is now believed, with practical unanimity, to be necessary for the protection of the public, and legislation to accomplish this is desired.

The joint use of terminals and pooling of equipment in facilitating the movement of freight and passengers is now accepted as a public policy which needs only appropriate legislation to effectuate. This viewpoint has obtained, growing out of methods devised under federal control, and is a

feature of federal administration which cannot be too highly commended, it yet needs to be greatly expanded in the public interest.

There seems to be a marked trend of public opinion in the direction of providing for the consolidation of railroads into a limited number of strong competing systems, such consolidation to be permitted, advised, or even required by federal authority, when it is deemed in the public interest to do so.

That the state commission shall no longer attempt, in the interest of their particular state, to interfere with rates affecting interstate commerce is a view which I believe to be the opinion of a very large majority of the people of the United States. There is yet a desire to retain all the powers that they have heretofore exercised, and through able advocates they entreat the public to trust them with the further exercise of this power. They protest vigorously that they ought not be deprived of the power of rate regulation, but it would seem to be the public opinion now that the Interstate Commerce Commission must have or should have absolute sway in the matter of interstate rates. But if there shall be a disagreement, the rule of the Interstate Commerce Commission must be absolute.

The development of a national system of transportation is now conceded to be a crying necessity, necessitating the articulation and economical use of all facilities, including tracks, terminals and transfer facilities of steam and electric railways, water ways and hard surface highways, and was strenuously advocated by Director General McAdoo before his retirement, and by his successor, Mr. Hines.

There are already over four hundred million dollars worth of demand obligations of the railroads now outstanding, which are likely to be increased before the end of the federal control, which the railroads owe to the government as a consequence of the taking over of the railroads by the government as a war emergency. In common fairness to the railroads, and in order that they may not be rendered impotent when they are returned to their owners, the business judgment of the country would surely favor legislative action whereby such indebtedness by the railroads to the government would be funded by the issue to the government of the obligation of the debtor company maturing within a period of years, with interest, say, at five per cent per annum, and secured in such manner as may be required by the Secretary of the Treasury.

Most significant of all is the general recognition, both in and out of Congress, that the national prosperity requires a new element of policy in regulation of rates which shall aim to assure adequacy of railway service and development of facilities. Particularly has discussion concentrated upon the problem of giving sufficient revenue to meet the necessities of the people served by one road where the increase in rates would have to be needlessly imposed upon the people served by a more prosperous competitor taking the same rates. It is now declared by railway managers and financiers of the first rank that this part of the problem would be largely solved through combinations, if sanctioned. Thus a strong road would be permitted to take over a weak road and spread its income and credit over both. This does not mean the elimination of competition within geographical areas. One of the most unmistakable of recent tendencies in opinion is away from the proposal of regional monopoly toward retention of competition.

It is conceded that even after the process of consolidation has reduced the system to a score or so, there might still remain some strong and some weak roads, and a further adjustment now evidently accepted is that in some way the process of adjusting inequality of conditions should include the use of a part of the surplus income to form a contingent fund for diffusion wherever most needed. Underlying such efforts as these in the direction of equalization is, of course, the assumption that revenue will be made sufficient for reasonable adequate service, facilities and development. Neglect of Congress to declare a policy designed to furnish revenue sufficient for operation and credit would, it is generally recognized, result in an experiment foreordained to failure, which would mean failure of private ownership or private operation.

Resolutions

No resolutions were adopted on the railroad problem. This topic will be the subject of a national referendum among member organizations.

Among the resolutions passed by the convention and dealing indirectly with the railroad situation are:

Request of the President that he call Congress into immediate extra session upon his return to solve the problems of the readjustment period. The right of individualistic effort in business is declared in this connection, together with opposition to any governmental entrance to industry and commerce.

The extension of the foreign trade of the country is necessary to supply a market for greater production and banking and insurance interests are urged to accompany the manufacturer into the new field.

Immediate resumption of all construction, particularly by federal, state and municipal governments in public works is urged.

Immediate return of the telegraph and telephone lines to private operation is demanded, together with legislation that will permit their merger, if desired.

The immediate consummation of all congressional waterways projects, already approved, is urged, the construction of terminals by cities upon waterways advocated and the co-ordination of waterways with railways suggested as the subject of a special committee's effort to obtain needed legislation.

Mr. Plumb Opens the Campaign

"THE ARRIVAL IN WASHINGTON of Mr. Glenn E. Plumb, author of the Plumb plan for the government ownership and operatives' management of railroads, marks the opening of a nation-wide campaign for the solution of the railroad problem along new and wholly original lines," according to a notice sent to the press on May 3 signed "The Plumb Plan, by R. P. Risley, Manager," containing an interview with Mr. Plumb, who is attorney for the four railroad brotherhoods and the ten railroad employees' organizations affiliated with the American Federation of Labor. The plan was outlined by Mr. Plumb in his recent testimony before the Senate Committee on Interstate Commerce. The press notice says it is to be incorporated in the form of necessary bills for legislative action which will be introduced at the approaching special session of Congress, and that copies of the plan will be sent on request and personal interviews will be arranged by special appointment.

"I am here to stay until the solution of the existing railroad problem is found in the enactment of legislation as endorsed by organized labor and civic and public bodies throughout the nation, with such reasonable modifications in non-essentials as may be deemed expedient in the preparation and framing of the proposed bills," Mr. Plumb is quoted as saying in reply to inquiries on his arrival from Chicago.

"The coming session of Congress will, in my opinion, be only a preliminary skirmish—there is such division of sentiment among the parties in interest that I do not anticipate any railroad legislation of a definite character at the special session.

"The time will be necessarily short, and the session crowded with urgent measures bearing especially upon appropriations. The big issues will, however, be clearly defined, and next winter the fight will be on in earnest, accentu-

ated by the importance of a national campaign in the summer."

"You expect, then, that the railroad problem will develop into a Presidential campaign issue?" Mr. Plumb was asked by his press agent.

"Inevitably," he replied. "I do not see how that can be avoided. The railroads have always been in politics, and it requires politics to take them out. It is a political problem pure and simple, demanding a political solution. Personally, I think the whole question should be put up squarely to the people. In this I agree with Major-General Thornton, inspector general of England's railways, who in a recent interview at Philadelphia, is quoted as saying:

"Put it up to the people direct. Whether the government or private interests run the roads, the people have to pay, so let them decide. Why not vote on this?"

Steps are now being taken to obtain the sentiment of every candidate for a political office in this country having to deal with the problem, so that he must declare himself on this issue, the press notice states.

"The plan of government ownership which we advocate is so entirely different from any other proposition of the kind before the public that the usual arguments are answered before they are advanced against it," Mr. Plumb continued. "The question of government ownership can be debated, as it is being debated all over this country almost daily, with affirmative or negative decisions rendered, and still the essential features of our plan would not be touched upon. There is a very general misapprehension in the public mind respecting the difference between government ownership and government administration, to say nothing of the essential factor of the operatives' and the public participation in management which we introduce. It is beginning to be realized that war-control applied to over-capitalized corporations operated for private profit bears no more relationship to rational railroad functioning than does the moon to the proverbial green cheese.

"One of the numerous vital defects inherent in each of the half-a-dozen plans submitted by the railroad interests at the recent Senate hearing is the inevitable demand for a rate-increase or its equally inevitable alternative demand for a government subsidy. If these demands are not fully met, any deficiency must be made up by a wage reduction. These plans, furthermore, provide only for transferring the persistent drain upon the investing public, which must advance, as estimated by the late J. J. Hill, a billion of new funds needed for capital charges yearly, from the investing public to the taxpayers of the nation. They do not furnish the supply to meet the drain. They do not stabilize rates. They solve nothing. Our plan, on the other hand, meets every condition essential to sane financing and proper operation of our entire railroad system, trunk lines, 'weak sisters,' and short lines all included."

Orders of Regional Directors

DEMURRAGE DUE FROM U. S.—The regional director, Eastern region, by circular 600-2-5-3A713, reminds federal managers that demurrage bills accruing on government freight must be collected strictly in accordance with the tariffs. A large amount of bills against the War Department remain uncollected, due in large measure to the difficulty in arranging for payment of the bills at points where the military officer responsible for the charge has to certify to the accuracy of the amount. Evidently the bills will have to be submitted in a special communication to the War Department.

Interest on New Work During Construction.—The Eastern regional director, by circular 2700A714, prescribes regulations for calculating interest during construction on additions and betterments to railroad property where payment is to be made out of federal funds. The rate is 6 per cent, and it applies on work done since December 31, 1917. On a job costing $1,000 or less, or which is completed in one month, no interest is to be charged. A circular is to be issued containing further details.

Employees' Passes for Conventions.—A. H. Smith, regional director, Eastern region, by circular 2100-37A716 advises federal managers that employees regularly elected as delegates to conventions of their brotherhoods are to be granted free transportation both ways; and ordinarily these passes will be issued at Washington. Trip passes for side trips should be requested and secured through the usual channels.

Quarantine Against Barberry Plants.—The regional director, Eastern region, by circular 600-163A717 gives notice of a quarantine, issued by the Agricultural Department, against the shipment of barberry and certain other plants into the states of Nebraska, Iowa, Illinois, Indiana, Ohio, North Dakota, South Dakota, Minnesota, Montana, Wisconsin, Michigan, Wyoming and Colorado, because of the capacity of these plants for harboring the black stem rust, dangerous to wheat.

Terminal Managers.—C. H. Markham, regional director, Allegheny Region, announces that the offices of the terminal managers at Philadelphia and at Baltimore, were discontinued on April 30.

Cartage and Lighterage Surety Bond.—Order 198 of the Southwestern regional director similar to Circular 600-68A699 of the Eastern regional director (*Railway Age*, May 2, page 1101).

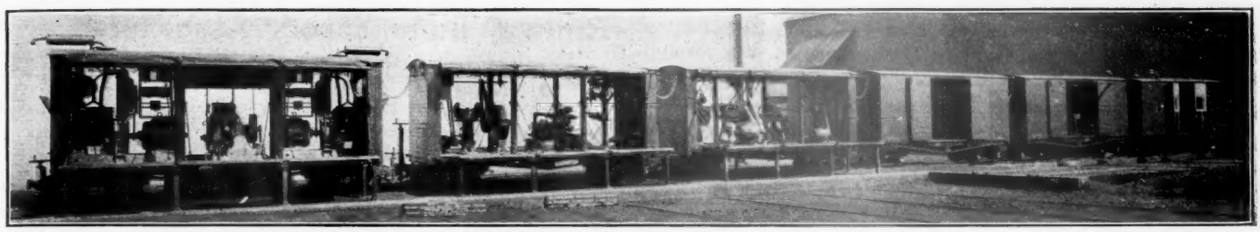
Oiling Track Joints.—Circular 206 of the Southwestern regional director states that a recent canvass in the Southwestern region discloses the fact that most of the larger roads apply crude petroleum or other cheap grades of oil to rail splices and bolts not only when first put in service, but also to those already in place. These are first, however, cleaned of rust and dirt. In view of the savings effected by this practice the regional director suggests that it be made uniform on all railroads. The oil should be applied at least twice a year.

Repair of Short Line Cars.—Order 197 canceling order 192 of the Southwestern regional director similar to Circular 500-14-5A699 of the Eastern regional director (*Railway Age*, April 18, page 984).

Posters for Employment of Returned Soldiers.—Supplement 4 to Circular 39 of the Northwestern regional director authorizes the placing in railroad stations of posters dealing with employment of returned soldiers and sailors. This arrangement may be made effective upon application of the local agents of the United States Employment Service or the Bureau for Returning Soldiers and Sailors. The Southwestern regional director in Supplement 4 to Circular 112 issues similar instructions.

Industrial Sidings.—Circular 208 of the Southwestern regional director suggests that, in order to expedite consideration of industrial sidings and in order to encourage new business these projects be handled by wire. Messages should give full information concerning the amount of money involved, how long it will take to lay the track and how soon the industry, will furnish the expected revenue.

U. S. Employment Offices.—The regional director, Eastern region, by circular 1500-80A719, asks federal managers to see that every useful advantage is taken of the United States Employment service. Complaint has been made that the railroads do not make full use of this service. Federal managers must, of course, exercise their own judgment in the selection of men, but they are requested to make use of the government employment offices so far as it is possible without harm to their own programs.



Repair Shop Train in Working Order

Repair Shop Train Used on Narrow Gage in Flanders

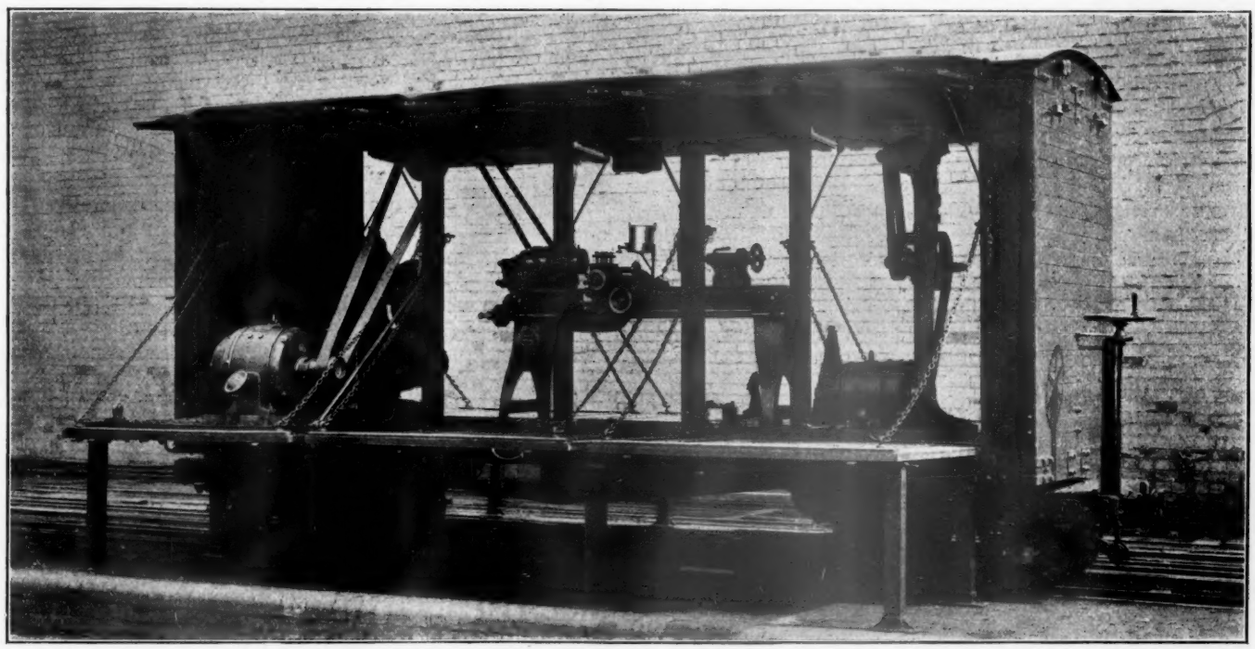
Portable Machine Shop Equipped With Electric Motor Driven Tools and Gasoline Generator Sets

By F. C. Coleman

ONE OF THE UNUSUAL FEATURES of transportation in the war zone was the system of a narrow gage military railway. The 16 cm. (1 ft. 11⅝ in.) gage roads operated by the British in Flanders had some interesting equipment, of which none was more novel than the mobile workshop repair trains constructed by the Gloucester Railway Car & Wagon Company, Gloucester, England. Six of these trains, each consisting of six cars, were built to the requirements of the Director General of Light Railways and Roads branch of the War Office and the Railway Material branch of the Ministry of Munitions for use on the lines serving the standard gage railway system. The train comprises a generating car, two machine shop cars, a tool car, a supply car and an officers' car. The over-all dimensions of each unit are the same, being as follows: length over body 17 ft. 8½ in., width over body 5 ft. 4¾ in. and height from top of rail to top of body 9 ft. 1 in.

The generating cars are fitted with two direct connected gasoline driven electric generator sets each with 15 to 20 hp. engines and 10 kw. generators. These sets weigh approximately three tons each. The gasoline is carried in tanks at each end of the car and water tanks are placed below the under frame, while the muffler is located on the roof. In the center of the car there is an air compressor driven by a 10 hp. motor and connected to an air reservoir slung from the roof. The total weight of this car is approximately 8½ tons.

The machine shop car is furnished with a duplex wheel emery grinder, a 30-in. grindstone, a rapid hack saw, and a vertical drilling machine. The first two machines are connected to overhead shafting which is driven by a 3 hp. motor, while the other two are driven direct, each having a 2 hp. pipe ventilated motor. Electric lights are placed over each machine. The electrical connection between the cars is made by means of insulated cables which are plugged into special fittings on the end of the car. The total weight of this car is 5 tons. The second machine shop car con-



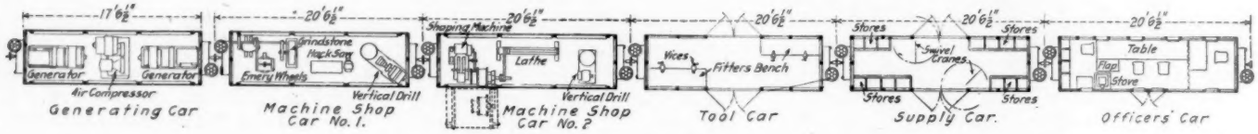
Machine Shop Car Showing Motor Mounted on Hinged Side Panel

tains one 8 in. shaper driven by a 1½ hp. variable speed motor and a 6 in. lathe with a 21 in. chuck driven through a countershaft attached to the roof by a 2 hp. motor on the bottom portion of the falling side. There is also a small drilling machine in this car fitted with a chuck and driven by a 2 hp. motor. The weight of this vehicle is about 5¼ tons.

The tool car has two fitters' benches with four vises and is equipped with shelves for holding tools, etc. The supply car is provided with two swivel jib cranes, one on either side. Three rows of shelves are provided for storing material and there are also large bins below the shelves. The cranes swing out beyond the side of the car and the shelves are so arranged that they clear the crane when swung in and not in use. The floor space in this car may be used for portable articles such as forges, jacks, drills, etc. The weights of the tool van and store car are about 3¾ and 4⅛ tons, respectively.

The officers' car is divided by means of a partition into two offices. The smaller of these, for the accommodation of the deputy assistant director of light railways, is 4 ft. 6 in. by 4 ft. 11 in. and is heated by an electric radiator. The general office measures 12 ft. 8 in. by 4 ft. 11 in. and has a small coal stove for heating. The car is well equipped with electric fixtures, both stationary and portable.

From the illustrations it will be noted that the machine shop cars are provided with hinged side doors, the top half forming a canopy and the bottom half when lowered making a platform on which the men have room to work. The platform is supported by chains and wood posts reaching to the ground. During stormy weather use is made of tarpaulins, these being fastened to the canopy and thus completely screening the men from the weather. The underframes of the cars are constructed of wood strongly braced by angle trussing. The trucks are similarly wooden framed with the drawbars built in so that the pull is transmitted through the trucks instead of through the body of the cars, as is the usual practice on broad gage roads.



Plan of Shop Train for British Military Railways

Homeward Bound. Transferring Wounded Yankees from a Hospital Train to an Ambulance Bound for the Docks at St. Nazaire

Railway Storekeepers' Association Reorganized; Now Section 6, A. R. A.

THE EXECUTIVE COMMITTEE of the American Railroad Association has created an additional section, to be known as Section VI, to consider and report upon all questions affecting the purchasing, selling, storing and distribution of materials and supplies, and kindred subjects; and the section will include the former activities of the Railway Storekeepers' Association. In this section the representatives of the railroads will be officers of the purchasing and stores department.

J. E. Fairbanks, general secretary of the association, in circular No. 1949, has issued a tentative code of rules of order for the section, as approved by the executive committee. These rules, in principle and very largely in detail, are like those which have been adopted for the other sections of the association. (*Railway Age*, January 17, 1919, page 194; March 7, 1919, page 535.) The membership is divided into three classes, representative, affiliated and life. The life membership is for railroad officers and others "whose work and interest have been beneficial to the section." The present honorary members of the Railway Storekeepers' Association are to be continued as life members of the section.

The section is to be managed by a general committee of 16 elected members, and, in addition, during the period of Federal control, of three representatives of the United States Railroad Administration, to be designated by the director of the Division of Purchases. The elected members must be divided equally between the purchasing departments and the stores departments; and during the period of Federal control there must be two from each Federal region, and two from Canadian railroads. The regular meeting of the section is to be held in May of each year, and at that meeting officers are to be elected. The time and place will be designated by the general committee three months in advance.

The first general committee, which has been appointed by the executive committee, will organize the section and will serve until a regular election is held. This committee consists of the following:

H. S. Burr (Chairman), Superintendent of Stores, Erie Railroad.
E. J. Roth, Manager, Stores Section, Division of Purchases, United States Railroad Administration.
S. Porcher, Assistant Director, Division of Purchases, U. S. R. A.
G. G. Yeomans, Assistant Director, Division of Purchases, U. S. R. A.
A. W. Munster, Purchasing Agent, Boston & Maine.
W. G. Phelps, Purchasing Agent, Pennsylvania Lines West of Pittsburgh.
E. W. Thornley, Supervisor of Stores, Allegheny Region, U. S. R. A.
B. T. Jellison, Purchasing Agent, Chesapeake & Ohio.
J. P. Murphy, General Storekeeper, New York Central (West).
H. C. Pearce, General Purchasing Agent, Seaboard Air Line.
H. H. Laughton, Staff Officer, Materials & Supplies, Southern.
G. E. Scott, Purchasing Agent, Missouri, Kansas & Texas.
W. A. Hopkins, Supervisor of Stores, Southwestern Region, U. S. R. A.
F. D. Reed, Purchasing Agent, Chicago, Rock Island & Pacific.
H. E. Ray, General Storekeeper, Atchison, Topeka & Santa Fe.
F. A. Bushnell, Purchasing Agent, Great Northern.
J. E. Mahaney, Supervisor of Stores, Northwestern Region, U. S. R. A.
E. N. Bender, General Purchasing Agent, Canadian Pacific.
E. J. McVeigh, General Storekeeper, Grand Trunk.

The car shops of the Atchison, Topeka & Santa Fe, in Chicago, formerly known as the Empire Car Shops, were destroyed by fire on April 21. The fire was caused by crossed electric wires in the blacksmith shop. A planing mill, blacksmith shop and machine shop, including machinery, were totally destroyed; estimated loss $65,000.

Rate-Making Powers of the Director General

Right of the Federal Government to Prescribe State Rates Argued by the Supreme Court

THE RATE-MAKING POWERS of the state authorities were compared with the "bleaching bones of the Hindenburg line" by John Barton Payne, general counsel for the Railroad Administration, in the argument before the United States Supreme Court on Monday in the test case appealed from the Supreme Court of North Dakota involving the question of the power of the director general of railroads acting for the President to prescribe rates for services wholly within a state. The case arose on a writ of error to review a judgment of the North Dakota supreme court directing the issuance of a peremptory writ of mandamus commanding the Northern Pacific Railway Company and Walker D. Hines, as director general of railroads, to desist from collecting for service wholly within the state any rates, fares or charges other than those on file in the office of the State Board of Railroad Commissioners. The rates involved are those put in effect by General Order No. 28 issued by Director General McAdoo on May 25, 1918, which were not filed with the North Dakota railroad commission except for purposes of information, and the laws of that state regulating the procedure to be followed by the common carriers in increasing rates, fares and charges were not absorbed. Arguments for the Railroad Administration were made by Judge Payne and Charles Donnelly, assistant general counsel, and for the state by Frank E. Packard and W. V. Tanner. A brief was also filed on behalf of the National Association of Railway and Utilities Commissioners as *amicus curiae.*

The brief of the Railroad Administration states that the court erred in holding that section 10 of the federal control act of March 21, 1918, does not confer on the President authority to initiate intrastate rates superseding pre-existing rates prescribed by state authority; also in holding that under section 15 of that act pre-existing intrastate rates remain in effect as lawful police regulations; also in holding that the term "police regulations" as used in section 10 embraces regulation of railroad rates and fares, and that the court erred in entering judgment in favor of the plaintiff. The argument of the Railroad Administration is summed up in the following points:

1. Congress was empowered by the Constitution to vest in the President or in the Interstate Commerce Commission control over intrastate rates and fares.

2. By the acts of August 29, 1916, and March 21, 1918, the President was given control over all traffic, state and interstate, and was empowered to initiate rates, fares and charges by filing them with the Interstate Commerce Commission.

3. Section 15 of the act of March 21, 1918, does not limit or qualify the power given by Section 10 to initiate rates.

4. Section 15, as construed by the court below, is repugnant not only to the specific provisions of Section 10, but as well to the whole spirit of the federal control act. It must be construed so as to harmonize with those provisions and with that spirit.

5. Any state regulation limiting the President's right to initiate rates and fares would affect the transportation of troops, war materials and government supplies.

6. Any doubt as to the meaning of the law will be resolved in favor of the Executive's practical construction of it.

Some extracts from the brief are as follows:

So complete was the control given to the President "in time of war" over systems of transportation by the act of August 29, 1916, that he was authorized to utilize them for the transportation of troops, war material, etc., "*to the exclusion,* as far as may be necessary, of all other traffic thereon." Possessing authority *to exclude* all other traffic, state or interstate, he could, of course, say what should be charged for moving it.

Again, section 10 of the act of March 21, 1918, gives the President express authority during federal control to initiate rates and fares by filing them with the Interstate Commerce Commission; and that commission upon complaint is empowered to enter upon a hearing concerning the justness and reasonableness of "said rates and fares." This authority covers *all* rates and fares. It is not limited to interstate rates or fares, nor can any reason be suggested why it should be so limited. Every consideration which could prompt the President to increase interstate rates must, of course, prompt him to increase those applying wholly within a state; indeed, discrimination must inevitably result if there were an increase of the one class without a corresponding increase of the other. Congress by section 10 did indisputably give him power to increase interstate rates and deprived the Interstate Commerce Commission of the power to suspend them; the state does not and cannot deny this. Yet its argument is that though the law was, as expressly declared in its last section, "emergency legislation" enacted by Congress in time of war, under its war powers, and designed to vest in the commander in chief authority commensurate with his duties and responsibilities, it yet left him a helpless petitioner before 48 separate and independent state tribunals for the permission necessary to make his action effective and lawful.

Moreover, the power thus given to the President by section 10 to initiate "rates, fares, charges, classifications, regulations and practices" must be considered in the light of the purpose for which he was to initiate them, and the manner in which the properties were to be operated, as shown by that section. It was recognized that to pay increased expenses, taxes and compensation to the companies he would probably be obliged to increase rates; and it was provided that if complaint should be made to the Interstate Commerce Commission regarding them consideration must be given to his certificate that he had in fact been obliged to do so. The properties, it was said, were to be operated "as a unit," and "under a *unified* and co-ordinated *national* control." How could they be so operated if subject to the regulation of the various states as to a considerable part of their traffic? And how was the President to proceed to get the needed additional revenue? Was he to make a segregation between interstate expenses and returns, and intrastate expenses and returns, along the lines pursued in the various rate cases with which the court is familiar? Such segregations, while theoretically possible, are essentially impracticable, and as this court must have come to realize are of little value when made. But if we accept the theory that it was the duty of the President to deal with each state as to the rates within the state, and to deal with the Interstate Commerce Commission only as to the interstate rates, such a view must proceed upon the idea that there is a practical basis for segregation. If this is true, it must follow that the President ought to have made a separate study of all the intrastate operations so as to decide how the increased burden should be divided. If the President had undertaken

to do this it would probably have been 1924 or 1925 before he could have reached a conclusion.

Surely it is not credible that Congress in providing a method to meet a *war emergency*, intended any such result.

It is said, however, that the very language of section 10 shows that it was never intended to apply to intrastate rates, because it authorizes the commission on complaint to make only "such findings and orders as are authorized by the federal act to regulate commerce," and to enforce them as provided in that act.

This argument utterly misconceives the scope and purpose of the language in question. That language authorizes the Commission to make *"such"* findings and orders as the act to regulate commerce authorizes. Now, what orders and findings does that act authorize? It authorizes findings as to whether rates under attack are unjust or unreasonable; as to whether they are unduly discriminatory or unduly preferential; as to what will be proper rates to substitute therefor; as to whether practices of the carriers are proper; as to whether a claimant has suffered damage and is entitled to reparation; and it authorizes orders giving effect to its findings and in certain cases—as where the order requires the payment of money—proceedings in court to enforce them. Congress might have enumerated specifically each of the findings and orders described in the act to regulate commerce which it was empowering the commission to make; but it wished to avoid circumlocution. It was enacting emergency legislation dealing with temporary conditions. The machinery already provided by the interstate commerce act was adequate to any case involving a complaint as to rates, and therefore it authorized the commission, in dealing with any case involving rates, whether state or interstate, to make findings and orders *such as* (i. e., *of the character of*) those authorized by that act.

Far from telling against the construction for which we contend, the language here in question tells distinctly in its favor. Had section 10 been concerned alone with interstate rates and fares, there would have been no point in giving to the commission authority, when such rates were attacked, to make such findings and orders as the interstate commerce act authorized. *The commission had that authority already.* The very purpose of the language was to give it like authority in cases of a character which it had not previously been authorized to consider.

The state contends that in preserving unimpaired its "lawful police regulations" Congress restricted to interstate commerce the authority given by section 10 to initiate rates; or, stated differently, that this language in section 15 proves that section 10 was not intended to have the broad effect now claimed for it. The argument is that laws relating to the regulation of rates and fares are "police regulations," and that these are not preserved unimpaired if the President is given authority to disregard them.

Taking the term "police power" in its broad sense, it is undoubtedly true that laws regulating rates and fares may properly be referred to that power; but in its broad sense almost every legislative enactment might be referred to it.

It is not in this broad sense that the term is commonly used. In its ordinary sense it is taken "to extend to the protection of the lives, health and property of the citizen and to the preservation of good order and the public morals."

Moreover, it is to be observed that it is not the "police power" of the states that section 15 preserves unimpaired, but only their "lawful police regulations."

It is said, however, that the history of section 15 in its passage through both houses proves that Congress intended by that section to preserve unimpaired the state's power of rate regulation. This argument rests upon the fact that the bills dealing with this subject which passed the Senate and House, while generally alike, had numerous points of difference in detail, and were therefore referred to a conference committee. The House bill, as thus referred, provided, that "nothing in this act shall be construed to amend, repeal, impair, or affect the existing laws or powers of the states in relation to taxation, or the lawful police regulations of the several states, except wherein those regulations may affect the transportation of troops, war materials or government supplies, *the regulation of rates, the expenditures of revenues, the addition to or improvement of properties*, or the issue of stocks and bonds." The conference committee struck out the italicized words, and the remainder was reported with slight changes as the present section 15, and adopted with the rest of the bill. No explanation whatsoever was made by the conferees of their purpose in eliminating these phrases. The hearings before committees, and the observations of members in the course of the progress of the bill show that it was the purpose and aim of those who advocated the adoption of the provisions of section 10 to vest in the President primary control of *all* rates, state and interstate.

Again, if all state police regulations in the broad sense were to be observed, it is not alone in the matter of rate regulations that the President has been at fault. How about state laws forbidding consolidation of parallel and competing lines? These certainly are police regulations in the broad sense. He has disregarded them. Was he bound to observe them? He thought he was not, for he was told by the act that "a *unified* and co-ordinated *national* control" was provided for. Unification and co-ordination and nationalization of the railroads were the primary objects sought to be obtained; and can anything be more absurd than to suppose that Congress meant to undo its own work, and by its use of the term "police regulations" in section 15 to defeat the very purpose for which the law was enacted?

That it is opposed to the specific provisions of section 10 is apparent at once. That section tells the President that by filing them with the Interstate Commerce Commission he may initiate rates which the commission shall be powerless to suspend pending final determination; and this, as we have seen, within the principles of statutory construction which this court has laid down, means *all* rates, state as well as interstate. Section 15, on the other hand, as construed by the court below, directly negatives this and tells him that as to traffic moving locally within each of the 48 states, he may not initiate rates in this way, but must observe existing state regulations. But the language of section 10 is specific; it deals directly with the subject in hand, namely, rates, and tells the President how he may initiate them. The language of section 15, out of which the court below spells a prohibition against this, is general. It is not an express statement that he may not initiate those intrastate rates, which section 10 says he may. It is a mere general statement that those exceedingly vague things called "lawful police regulations" are to remain unimpaired.

Even if a state law regulating rates is a "lawful police regulation" within the meaning of section 15, the President, by the very terms of that section, was relieved from the necessity of observing it if its observance would affect the transportation of troops, war materials or government supplies. Is it certain that such a law would *not* have that effect; or, to put it on the lowest ground, is it *so* certain as to justify a court at this day, when the crisis is past, in undoing what the President then did? He was in charge of the transportation systems of the country. He had to operate them; and the consideration of the first importance was, of course, to utilize them in the movement of troops and war material. He could not in such an exigency allow their operation to cease through the disaffection or strikes of employees. This court knows judicially that on the very day when the director general issued Order No. 28, increasing railroad rates, he issued as well Order No. 27, increasing by several hundred millions of dollars annually the wages of railroad employees. The money to meet this added

charge must come from some source; it was proper that it should come from the shippers and passengers for whom, for the most part, it was incurred; and it was proper, indeed it was necessary, that in distributing the burden interstate shippers and passengers should not be discriminated against. Confronted with this situation the President might well have said: "These state laws which require me, at such a time, to observe all the formalities of a procedure adapted to times of peace, in order to get that financial assistance which to be effective must be obtained promptly, are a real hindrance to the effective prosecution of the war, and their observance would affect the movement of troops and war materials." And if in the exercise of his executive discretion he took this view, is it the function of a court now to say that he was wrong?

It is to be remembered that the action complained of was not that of a railroad corporation. They were increased by the President of the United States, in time of war, at a critical period in the history of the nation and of the world, and in the exercise of what *he believed* to be authority duly vested in him by Congress. No one questions or would dream of questioning his good faith; no one would think of suggesting that in what he did he or those through whom he acted had any ulterior or unworthy ends to serve. He acted with absolute impartiality. He imposed upon the commerce of North Dakota no burden not placed equally upon the commerce of every other part of the nation. His authority to do this was not then challenged. North Dakota, like every other state in the nation, acquiesced in and recognized it; and from the intrastate rates thus established and assented to many millions of dollars, as the answer shows have been collected and disbursed by the United States Government. We have, then, the disinterested, practical construction placed upon a law by those whose duty it was to administer it, and acquiesced in by the very parties who now challenge it. Unless that construction was clearly erroneous the courts will sustain it. Authorities in support of this proposition might be multiplied indefinitely.

Counsel for the state denied the contention of the Northern Pacific that because it no longer has possession and control of its property this suit as to it should be dismissed. They contended that the Northern Pacific is a necessary and proper party defendant, and that it is apparent that Congress intended to preserve the right to sue. The state also argued that the federal control act did not abrogate the laws of the state respecting the establishment and regulation of rates, and that it is the duty of the court to adopt the statutory construction that will reconcile the two statutes—the Interstate Commerce Commission act and the federal control law. Mr. Tanner argued that the states have no arbitrary powers which would interfere with the President's exercise of his control over the railroads, saying that the decision of the Interstate Commerce Commission in the 15 per cent rate advance case was immediately followed by the states. The contention was that while the President might initiate rates, the law contemplated that the Interstate Commerce Commission should review the interstate rates, and that the state commissions should review the state rates, and that their laws regulating the procedure to be followed were not inconsistent with the federal control act.

The state brief said in part:

The fact that the railroads are instrumentalities of interstate commerce does not preclude the exercise by the state of powers establishing regulations governing their internal commerce, and the fact that they are temporarily agents of the national government to execute national policies in war time does not exempt them from state regulation. The national power exercised for the enactment of national measures in war time emergencies is paramount, but the question here is not merely one of the existence of inherent power, either in the national government or in the states, but the purpose manifested by Congress to exert its powers to the exclusion of that of the states.

In matters growing out of the war emergency, for which Congress deemed it necessary to prescribe regulations, there can be no question that the national powers are paramount and exclusive—whether these matters involve interstate commerce or the employment of other agencies for the execution of constitutional functions; but in so far as these instrumentalities are employed only in the purely local concerns of the state, regulatory power is reserved to the state authority.

We have shown that the mere fact that a railroad may be an agency of the Federal Government for military or other purposes, does not necessarily exempt such railroad from state authority.

It will hardly be contended that the act of August 29, 1916, operates to abrogate, repeal or suspend the provisions of law, federal and state, relating to the publication and establishment of rates, except as such laws may be affected by the utilization of the railroads "to the exclusion as far as may be necessary of all other traffic thereon, for the transfer or transportation of troops, war material and equipment, or for such other purposes connected with the emergency as may be needful or desirable."

Is the power here vested in the President to "initiate" rates inconsistent with the laws of the state relating to the filing and establishment of rates? Surely it is not. The use of the word 'initiate" in defining the power of a public agency is new, but manifestly it is used in the sense of proposing a rate rather than in the sense of *fixing* or *establishing* the rate. The explanation of the use of this word is probably found in the fact that under the act of August 9, 1917 the carriers were required to first obtain the approval of the Interstate Commerce Commission before filing any increased rate or charge, and to the desire to remove this restriction during the period of federal control. Prior to this statute the carriers themselves, under federal laws and under the laws in force in most of the states, have always had the power to *initiate* rates. This power, however, has never been regarded as inconsistent with the *fixing* and *establishment* of rates by regulative commissions nor with the obligation to comply with provisions of law respecting the filing and publication of the rates so initiated.

Nor is an inconsistency created by the provision for the filing of the rates initiated by the President with the Interstate Commerce Commission. Prior to federal control rates initiated by the carriers were required to be filed with the state commissions and the interstate Commerce Commission, and, as pointed out, since the initiation of the rate is not the fixing of that rate, there is no inconsistency in permitting a rate to be initiated by filing it with the Interstate Commerce Commission and the concurrent requirement of compliance with state laws upon the subject. We believe this is the more apparent when regard is had to the provision forbidding the Interstate Commerce Commission from suspending rates initiated by the President pending final determination. In this provision Congress recognized the existence in the commission of a power to suspend rates initiated by the President and evidently felt it necessary to deprive the commission of that power during the period of federal control, showing that Congress did not regard the power to initiate rates by filing the same with the Interstate Commerce Commission as inconsistent with the power of the commission to review, regulate and fix the rates so initiated.

The provisions of section 10 of the federal control act modify to some extent the powers of the Interstate Commerce Commission in respect to the rules established for its guidance in the determination of questions affecting rates. It must proceed with due consideration to the fact that the railroads are being operated "under a unified and co-ordinated national control and not in competition."

The absence of an express provision in section 10 saving

in power of the states to act through the state commissions in cases involving intrastate rates is explained by the provision of section 15 saving the "police power" of the states. Having preserved to the state their right to make police regulations (with certain exceptions), it was wholly unnecessary to expressly save the jurisdiction of the state authorities as was done in the case of the Interstate Commerce Commission.

Certainly those provisions of the federal control act with relation to the exercise by the Interstate Commerce Commission of the powers *now possessed* by that body, although modified by the existence of federal control, cannot be held to be inconsistent to the point of conflict with the existence of state laws regulating the publication and fixing of "reasonable rates for its exclusively internal traffic."

It will undoubtedly be argued that the government, as the temporary proprietor of the property, has the right to *initiate and establish* rates. No one disputes the power of the government to initiate rates. Indeed, the law specifically provides the method of procedure with respect to interstate rates. The question is as to the power in the matter of purely intrastate rates. The government claims that the war emergency justified the exercise of the supreme power of the federal government. Assume that it did. This is no reason why the law should not have said so.

It was argued by counsel for the Railroad Administration in the state court that it would be "absurd and contrary to the general welfare" to permit the government to establish interstate rates for general commodities between points in different states and deny the right to fix the rates on the same commodities between points wholly within a state. Many will agree that the accident of state lines should have no controlling effect, but this condition is no more absurd in time of war than in time of peace, and it is just the condition that obtains in time of peace under the respective jurisdictions of the Interstate Commerce Commission and the authorized state commissions.

The matter of the charges for carrying passengers and freight between the various stations situated along the lines of the Northern Pacific in the state of North Dakota has no direct effect upon the transportation of troops, war materials, or government supplies. As stated before, it must be presumed that the established rates are reasonable. Such rates, governing as they do the transportation of property between individuals, have no more effect upon the conduct of the war than does any other purely local police regulation.

The President has not been vested with authority to set aside state laws, whenever he thinks it necessary to do so, for purposes connected with the war or for purposes connected only with the ordinary administration of railroad affairs. The act subordinates state laws to such orders as the President is validly authorized to make by the act of March 21, 1918, and the act of August 29, 1916. Any order not so authorized would be of no effect.

Under the act of March 21, 1918, the President is authorized to make only such orders as are necessary or proper to carry out the objects of federal control, *i. e.*, the use of the railroads for war and other purposes connected therewith.

No one would contend, for instance, that the President may make orders with respect to the method of recording documents affecting the title to the property of the carriers, the matter of establishing liens against their property, the liability of the carriers for damages in cases of personal injury or loss or destruction of property.

Clearly the state laws upon these subjects are not inconsistent with the act of Congress and cannot be abrogated or superseded by an order of the President. The laws governing the carriers in these matters have no relation to the conduct of the war. Similarly, if the obligation of the carriers to transport property at reasonable rates established by state law is not inconsistent with the provisions of the acts of Congress, it is not within the power of the President to interfere with the force and effect of these laws.

We believe that when the federal control act is viewed in the light of the changes made in its text during the time it was under consideration by Congress, prior to its final passage, there can be but one opinion upon the question of the purpose of that body, that the states should retain their power to regulate rates applicable to their strictly domestic commerce.

When a proposed act as introduced in the legislature establishes one rule (*i. e.*, broadly empowers the President to fix rates) and during its progress through that body is changed so that, giving the words used their ordinary definite meaning, the act means something else (*i. e.*, intrastate rates to be fixed by local authorities), that fact is of the greatest importance in determining the intention of the legislature. The act should be examined in the light of the change; and we submit that when this is done, the conclusion is unavoidable that Congress intended, as it said, that nothing in the act should be construed "to repeal, impair or affect * * * the lawful police regulations of the several states * * * "

The Economic Aspects of the Control of North China

By Frank Rhea

THE CONTROL of the future supplies of iron and fuel in the Far East is not only of great importance to the industrial development of that entire region, but it is bound to have a profound influence on the whole industrial world on account of the great volume of these resources in China with her unlimited supply of willing and capable labor.

There are undoubtedly large deposits of very good iron ores in China. The proved deposits of iron at the present time are largely in the provinces of Hupei and Anhui, all within reasonably short distances of that most unusual water route, the Yangtse river, the only great river of the world in the temperate zone navigable for 1,000 miles from its mouth running from west to east. All other great rivers, except the Amazon, run from north or south, as for example the Mississippi.

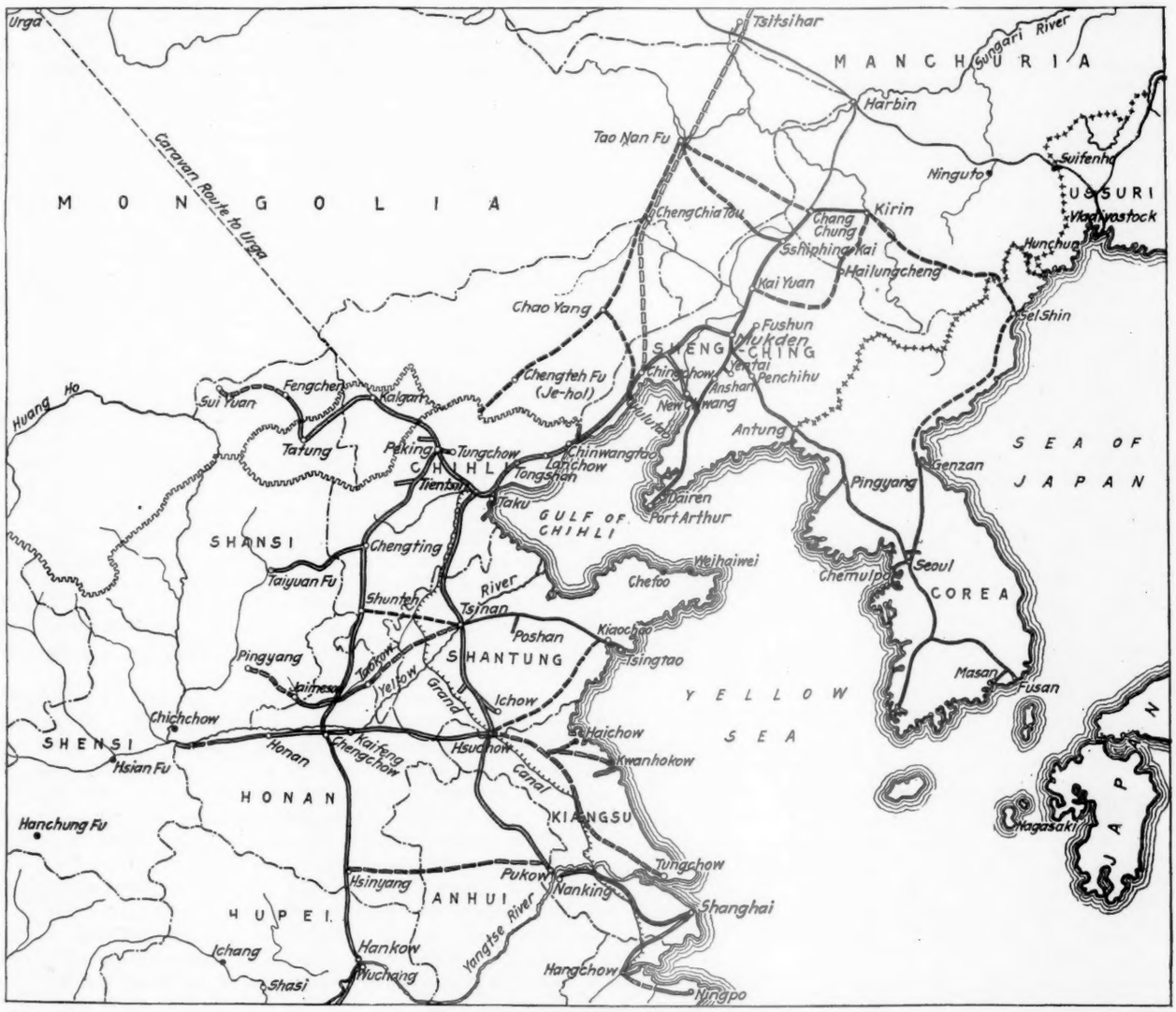
There are no doubt many great deposits of fuel in China, but few of these have been scientifically proved to date. It can be stated, however, and supported by good authority, that probably the greatest coal field in the world outside the United States is the general field in northern China, the central part of which lies in central and southwestern Shantung, all of northern Honan, all of southeastern Shansi and southern, western and northern Chihli. The known part of this field starts in northeastern Chihli at the Kaiping Basin, between Lanchow and Tongshan, and keeps inside the Great Wall and the Hunangho or Yellow river until Chichchow is reached, where it extends south of the Yellow river into southwestern Shantung—the limits of the field extending south of Honan and Kaifeng.

The Kaiping Basin, controlled and operated by the Kailan Mining Administration (Sino-British*) with the exception of the Fushan deposits in South Manchuria controlled and operated by the South Manchurian Railway (Japanese), is the only large deposit of coal in China which has been thoroughly and scientifically proved and comprehensively developed. The outlet of the Kaiping Basin operations to the sea is by the Pekin-Mukden Railway (Sino-British) through the port of Chinwantao with a rail haul of less than 100 miles. The port of Chinwantao has been developed and is largely controlled by the Pekin-Mukden Railway.

*Chinese and British.

The Pekin-Hankow Railway (Sino-Franco-Belgian) for some two-thirds of its length either passes through or runs in close proximity to this great field, and there are now considerable developments on the northern end of this line. The Pekin-Suiyuan Railway, usually known as the Pekin-Kalgan (Chinese), by branches near Pekin, reaches deposits of this field, and there are a number of native workings on this line outside the Great Wall. The meter gage Cheng-Tai or Shansi Railway (Sino-Franco-Belgian) running from Chengting on the Pekin-Hankow to Taiyuanfu passes through one of the richest parts of this field. This is the only line not of 4 ft. 8½ in. gage in this part of China. Tientsin-Pukow Line (Sino-British) reaches important deposits in southwestern Shantung which would also be tapped by the proposed line (Japanese) from Kiaochao to Hsuchow.

The South Manchuria Railway (Japanese) taps the small but very good iron and coal fields at Penchihu in southeastern Manchuria, the important and completely developed and equipped Fushun coal mines and the indifferent Yentai coal deposits. Fuel from these three fields will be used at the new Anshan iron furnaces for smelting the indifferent ore found near the latter place. The rail haul from the Fushun mines to the ice free port of Dairen is less than 300 miles. What the coal and iron deposits are on the



The Railways of Northern China

The railways under the control of the Chinese Ministry of Communications are shown by open lines; the concessioned or Japanese railways by bold, full lines

The Taokow-Chinghua Railway (Sino-British) from Jaimeson to Taokow and the Pienolo Lines (Sino-Franco-Belgian) between Honan and Hsuchow both pass through extensive and excellent deposits of this great field. The Shantung Railway (now Japanese, formerly German) taps the indifferent iron and coal deposits near Poshan in northern Shantung, but the proposed extension of this line from Tsinanfu to Shunteh, where connections would be made with the Pekin-Hankow would give the Shantung Railway access to all this part of these great coal deposits and an outlet to the sea by way of the port of Tsingtao (Japanese). The proposed railways (Japanese) in the region from Jehol to Chao Yang to Tao-nan-fu is not known, or, if known by anyone, the information was not obtainable by the writer.

The coast of China north of the Yangtse river, including that of south Manchuria, is singularly devoid of good harbors, particularly ones that can be kept open in the winter. The really good harbors are the well-known and excellently equipped ports of Dairen and Tsingtao, both at present under Japanese administration, and the port of Ching-wangtao, practically controlled by the Pekin-Mukden Railway (Sino-British). Hulutao claimed in connection with Japanese rail-

way concessions is probably capable of being developed into a reasonably good port, which can be kept open during the long winters of this region. Port Arthur, located in the leased territory of Kwantung (Japanese), while valuable as a naval base, is of little value as a commercial port. Newchang in the mouth of the silt-carrying Liao River is unsatisfactory at the best, and is tightly closed during the long winters in this locality. Tientsin (Taku) is unsatisfactory, particularly for vessels of any size, and is also closed during the winter season. Chefoo is little more than open roadstead with poor land communications, and Weihaiwei has almost impossible land communications. Haichow and Kwanhokow are both undeveloped and neither is probably capable of satisfactory development. This very clearly indicates the strategic value of the control of the four practicable seaports of North China.

The railways controlled by the Chinese Ministry of Communications are shown by the open lines on the map. The concessioned railways are shown by the full lines. At present all these concessioned lines are under Japanese control and operation, except the Chinese Eastern. The lines in Corea are operated as part of the South Manchuria Railways. The black broken lines indicate the concessions claimed by the Japanese to build and operate additional railways in Shantung, Chihli, southern Manchuria and Inner Mongolia, and one of the special claims in this connection is the right to develop and operate the port of Hulutao, already mentioned. The open broken line indicates the general route of the so-called Kuhn-Loeb concession negotiated by the late Major Willard Straight for a line from Chinchow on the Pekin-Mukden Railway not far from Hulutao to Angin on the Amur river, crossing the Chinese Eastern Railway near Tsitsihar.

As already stated, the map and this brief description have been prepared to give the viewpoint of an engineer concerning the vast industrial and economic stakes which are at issue in the control of the transportation facilities of north China. These transportation facilities will completely dominate and control one of the world's greatest coal fields, combined with the great iron resources of China and also what was particularly impressive to the writer in several months' travel in this part of China, they will control the world's present greatest supply of willing, robust and capable labor.

American Rails for Birmingham, Eng.

THE STEEL MANUFACTURERS of the United States are carrying their competition in foreign trade to the home of the British supply manufacturer, one mill having recently taken an order for 1,200 tons of rails for the tramways in Birmingham, England. The placing of the order excited no small amount of criticism on the part of British interests, with the result that the purchasers issued a statement as follows:

"The recent announcement that the Birmingham Corporation Tramways Committee had accepted a tender for steel rails from an American firm has given rise to considerable discussion. It now appears that the facts are as follows: During the war the tramway tracks had become so defective that it was necessary to reconstruct several routes at the earliest possible moment. The committee, accordingly, invited tenders for the supply of 1,200 tons of rails. Three replies were received. One, from an American firm, offered full delivery, April-May shipment, and quoted the lowest price of the three. A second, from an English firm, could only offer delivery of about 50 tons a week, commencing in three or four weeks. The firm stated, moreover, that they could not agree to a penalty clause, in view of labor conditions and of their difficulty in obtaining raw materials. The third offer was also from an English firm, who quoted a still higher price, and could not deliver under 20 weeks.

"Had the committee accepted either of the English tenders the work could not have been completed this summer. It could not be done during the winter months, and it would, therefore, have been delayed for a year. Such a responsibility the committee, having regard to public safety, were not prepared to take. They were, therefore, obliged to accept the American tender."

The Modification of the Shipping Day Plan

OFFICIALS OF THE CAR SERVICE SECTION deny strenuously the statement made in the *Railway Age* last week, which has been made by some shippers and even some railroad men, that the "shipping day" plan (formerly called the "sailing day" plan) has been killed by the modifications that have been made in it to meet the objections of shippers and because the war emergency has passed. It is asserted, on the contrary, that the plan, originally adopted as a war emergency measure, has now received official sanction and that the shippers, through the National Industrial Traffic League committee, have pledged themselves to support its principle and to co-operate toward making it a success as a permanent measure now that concessions have been made to overcome the points of criticism that made the plan unpopular in some quarters. It is admitted that without the co-operation of shippers the complete object, which is principally to concentrate l.c.l shipments in through cars over direct routes, thereby obtaining the advantages of full loading and avoiding the delays, losses and expense incident to transfer, cannot be obtained, but they believe that when the shippers are approached in the right way and their interests are properly protected the necessary measure of co-operation will be forthcoming. They point not only to the assurances of large numbers of shippers who have come to appreciate the advantages to themselves, but also to the successful results which have actually been obtained in the Eastern region, where, although it would seem that the difficulties were greater than in other parts of the country, the plan has been most successfully worked out.

The modifications in the plan as agreed to by representatives of the Railroad Administration and the shippers on April 8, with the concurrence of a committee of state commissioners that had, however, no power to bind the commissions generally, were published in the *Railway Age* of April 11, page 942, and a later announcement by Director General Hines was published in the issue of April 25, page 1062.

The opinions of those who feel that the plan has not been emasculated are based on the fact that it was agreed that the shipper shall not be deprived of the right to route his l.c.l. freight over any line, or of delivering it to the carrier on any day except holidays and that the schedules of specified shipping days should be published only after mutual arrangement between representatives of the shipping public and the carriers. It was agreed that peddler cars should be operated daily, except where more limited service is agreed upon, and Mr. Hines' announcement stated that peddler cars are to be operated daily on week days except holidays "except where a less frequent service meets the requirements" and that "the foregoing shall not be construed as requiring the establishment of additional train service."

It is admitted that if the shippers should withhold their co-operation by refusing to assent to a less frequent service or to route their shipments via the scheduled through car routes, little could be accomplished, but confidence is felt that by eliminating from the shipping day plan some of the more or less arbitrary applications of it that were sometimes made during the war, the manifest opportunities for im-

proved service in the handling of l.c.l. merchandise by concentrating it in through cars will operate to commend the plan. It is also felt that many of the evils charged against the plan arise not so much from the operation of the "staggered service" or "skip-stop" features of the plan itself as from the deficiencies of the l.c.l. service during war time and during the period of labor shortage. Much animosity was also aroused by the occasional arbitrary disregard of the shipper's legal right to send his freight to the freight house on any day, but where tact and care in meeting the shippers' requirements have been used in working out the schedules the reports indicate that the plan has been remarkably successful. For example in the Eastern region 33,000 tons of l.c.l. freight per week have been forwarded direct to destination which formerly would have had to be transferred from one to three times en route. There are something like 1,000 l.c.l. transfer points in the country, all of which present opportunities for freight to be delayed, go astray or be damaged in handling, and before the shipping day plan was adopted many of these points had become badly congested. At Waverly transfer on the Pennsylvania near New York at one time 250 cars were held up for handling, whereas since the adoption of the plan the business at this point has been handled currently. At West Albany, N. Y., the number of shipments transferred has been reduced from 1,500 to 250 a day. The New York, New Haven & Hartford has been able to operate practically all of its local freight trains on a basis of service at each station every other day, with a weekly saving of about 15,000 train miles.

By way of illustration, the shipping day plan is compared with the skip-stop service plan adopted for the street car system in Washington and other cities in order to improve the running time during a period of congestion. While occasionally a would-be passenger is seen frantically gesticulating at a car that does not stop and "cussing" the motorman or the company because he feels his rights were infringed when he was asked to go to the corners where the yellow signs are, the man who is already on the car appreciates the fact that he will get down-town sooner than if the car stopped at every crossing.

What Railroad Plan Should the Country Adopt?

Private Operation and Constructive Regulation Without Guarantees of Fixed Net Return Favored

By Samuel Rea
President of the Pennsylvania Railroad Company

WHAT IS THE SO-CALLED "RAILROAD PROBLEM"? We must be assured as to this before attempting to prescribe the remedy. It is now admitted by the vast majority of our thinking people that government ownership and operation of the railroads are undesirable, and that individual enterprise has given, and will give, the public the best and cheapest service. It is also admitted that it is in the public interest that the capital required for enlargement of transportation facilities should be voluntarily furnished by private investors under the attraction of a satisfactory rate of return and degree of safety.

It is admitted that there must be responsible and reasonable governmental regulation over rate structures, over capital issues, and over wages.

It is admitted that railroads, subject to public regulation as to charges and service, are not naturally subject to the state and federal "anti-trust" laws, and that in order to get full use out of facilities and avoid waste in service, they should be encouraged to consolidate and co-operate up to a certain point, and beyond that point they should be encouraged to compete in service.

Regarding the final objects to be attained there is no obscurity whatever. All that the regulating authority has to do is to see that hurtful discriminations in rates or service do not exist, and that the rates yield an adequate but not an excessive return to the railroads, so that they can obtain from the investor the new capital required for expansion and improvements.

Several years ago these railroads were assigned to the strictest public regulation, controlling revenues and the chief expenses, standards of equipment, wages, working conditions, and investigation of accidents, and subject to numerous bureaus. But have we been freed from controversy or complaints; has more new mileage been constructed or has the cost of transportation been decreased and is their financial condition sound? The public can answer these questions. All the economies and the benefits of better equipment, heavier train loads, larger yards, stations, shops, etc., have been absorbed, and the return upon the property investment has, with few exceptions, been kept close to, and often below, the starvation line. The proportion of stock which the public would buy has been a minimum. The railroads have maintained and improved operating efficiency, but have been forced to restrict broad developments such as new mileage and electrification, and to finance the greater part of the railroads by the burden of additional debt, instead of through stock issues. In 1900 the total capital stock outstanding exceeded the funded debt by $200,000,000, but in 1916 the situation was reversed and the total funded railroad debt exceeded the capital stock by about $2,200,000,000. Even a conservative property like the Pennsylvania Railroad has found it impossible to sell stock for the last six years.

Railroads Not Allowed a Fair Return

The railroads were not in that period allowed a fair return, such as a business enterprise requires to live and expand. Banking rates of 6 per cent are legal, and public utilities are allowed rates to produce returns of 7 and 8 per cent, and higher, on their property investment, depending upon conditions and service. Railroad rates were regulated by charter and general laws, and later by competition, efficiency, and growth of the business, and ultimately by strict government regulation. Therefore, I feel that any return which a railroad can make under reasonable rates fixed by governmental action cannot be regarded as unfair, and should not be a matter of criticism when based upon an honest investment, and as a result of years of conservative financing, and able management.

We must consider the averages for a few years rather than for a single year. In the so-called Five Per Cent. Rate case,

which was decided in 1914, the Interstate Commerce Commission found that in the period from 1900 to 1913 the ratio of net operating income to the property investment in road and equipment, of the thirty-five railroad systems in the so-called Eastern district of the country had fluctuated between 5.19 per cent and 6.31 per cent, the yearly average having been 5.64 per cent. In the year preceding the Commission's decision, viz., 1913, this ratio had been 5.36 per cent. Having regard to these figures the commission held that in its opinion "the net operating income of these railroads in Official Classification Territory taken as a whole is smaller than is demanded in the interest of both the general public and the railroads." Experience demonstrated the soundness of that decision; yet in only five single years from 1900 to 1916 was a higher percentage earned by the railroads of the country. Taking three year periods, since 1900, only in that period ending with 1908 was an average return of 5.36 per cent exceeded in the 17-year period by the railroads of the country as a whole. But to avoid controversy as to the integrity of property investment let us take the Pennsylvania System whose property investment has never been questioned and is understated. In only one calendar year from 1910 to 1917 was the property investment return equal to 6 per cent. The return on property investment was 6.1 per cent in 1916, but in 1914 it fell as low as 3.92 per cent. All this proves conclusively to my mind that such returns were not sufficient for an expanding business. Is it any wonder that some railroads went into receivers' hands, or resorted to unsound financing? Appeals to the various state and federal regulators were long and costly, and even when the federal regulators were disposed to be reasonable, the states, or a state, deferred action.

The unsatisfactory plight of the railroad industry in America is due to the fact that while there was a general consensus that a policy of public regulation should prevail, we have had no definite national railroad policy, and no single authority responsible for the results of public regulation. The numerous regulating authorities have been governed largely by the great fear that the companies—or some of them—might make too much money from the rates. The seeds of distrust and timidity were sown in the minds of the investors by the continued hostile attitude of legislators and regulators to all railroads, and there was no foundation on which to expand. Consequently, speaking broadly, the rate of return allowed under regulation has been unattractive to the investor, and the industry has failed to regularly secure the new capital needed for its proper development. Briefly, I diagnose our real problem as weak railroad credit, which is directly attributable to the lack of responsible, constructive, regulation.

Finally, when confronted by war, the railroads were, as a war emergency measure, taken under federal control, with legislative restrictions removed. It was imagined that the word "unification" would cure all, that with a guaranteed rental the companies' financial strength would not be further weakened during federal control, and that the government could institute vast economies, and earn large profits. To this freedom from restrictions must be added the patriotic assistance of the public who were willing to endure any transportation inconveniences, and the services of experienced railroad men who devoted themselves to carry out the government policies, so as to assist in winning the war.

Government Operation Is Excessively Expensive

But a railroad problem still exists, notwithstanding the efforts of the Railroad Administration to prevent it. The result of federal control did not surprise experienced men in this country or abroad, but the cost was nothing compared to what it would have been under government ownership. I cannot express the situation better than it was expressed by Senator Cummins recently before the Iowa state legislature:

> "It costs the government more to do any given thing in a country like ours, where every man is a sovereign, than it costs anybody else to do the same thing. The history of every enterprise of a business character conducted by the government proves all and a great deal more than the statement I have just made. I disparage no one, and impugn no man's integrity. What I have said is not only the truth, but it is as natural as life itself."

These results do not peculiarly apply to our own country; they have been the experience of the world, wherever government ownership, government operation or government guarantee has been instituted, and when a policy is laid down for them to follow, subject to political exigencies.

Necessities of the Situation

How shall we approach the present situation to again make the railroad system the instrument of our future national progress? We must decide upon a national policy. Either government ownership, or responsible national regulation must be adopted. I believe it should be the latter. The essentials of the situation are adequate revenue to enable the companies not only to live, but to attract new capital for expansion, accompanied by constructive and responsible national legislation and regulation, committed to experienced men, assured of a long term of office to prevent the dread of reappointment, and paid sufficient compensation, and brought into state and local transportation necessities through regional commissions.

We have one system of National regulation from which we can take some comfort, i. e., the national banking system regulated through the Federal Reserve Board and the Regional Reserve Banks. That system permits and encourages prosperous banks, and we have confidence and pride in them. They stood the test of solvency in war time, and are the mainstay of the nation in its industries. Like the strong railroads a large part of their profits were made from rates that were reasonable, which profits, that might legally and morally have been paid as dividends, were invested in the expansion of business to serve the country. Yet banks have not been free from failures and bankruptcies in the past. In times of stress and depression our credit and currency system was often over-inflated and not helpful to industry, but we did not attempt to cure this solely by denunciation. Instead, we made the banks subject to one central reserve board to carry out a national policy through the federal reserve regional banks. The banks participate in the selection of the regulators comprising the boards of each federal reserve regional bank, but each individual bank, under the legal rate established, can earn as much as its individual management is able to earn. We recognize that their banking regulators must be men chosen from various walks of business life, beginning with the farm and ending with the bank itself. The banks are not forced to continuously take a small margin of profit, and therefore when confronted by weak conditions are not forced to bankruptcy. Compare bank dividends and profits with the railroads, and also compare the legislative treatment and regulation accorded to them with that accorded the railroads. Can it be possible that a dollar invested in bank stock, or placed on deposit, is a greater national trust than one invested in railroad securities?

The more that the business men and the public observe the success of banking regulation will they appreciate the principles for the rehabilitation of railroad credit recommended by the railroad executives. They will see the necessity for the railroads to have a separation of regulatory judicial questions from executive and administrative questions. They will see the effectivness of a responsible national regulatory policy by putting the responsibility for executive questions and actions where it properly belongs. In the case of the railroads, it should be lodged either in a cabinet officer,

or in a board headed by a cabinet officer, or by an officer like a permanent assistant secretary of war, as in the case of railroad control during our Civil War. Congress could safeguard the situation against such an official suggesting, appointing, removing, or compensating any railroad officer or employee. They will see the necessity of rates reasonable and adequate to sustain railroad credit, and the wisdom of national regulation of securities and wages. They will also see the necessity of co-operation and consolidation between the railroads, and the freedom from those restrictive laws and inadequate profits that have separated and weakened them in the past. During federal control the government recognized most of these features were essential to carry out an active transportation business, but will our legislators and regulators have the faith and courage to put through some such reasonable program, and deal as constructively with the railroads as with the banks, and will the state governments co-operate?

Does the fear of allowing the railroads adequate rates still exist?

I would point out that in many of our strongest companies, and notably in the case of The Pennsylvania Railroad System, which consists of weak lines as well as strong lines, part of the surplus was continuously put back into betterments and improvements, and in aiding traffic-feeding lines, as a conservative measure of finance. The surplus of the Pennsylvania System did not arise from extortionate rates, but very largely from paying dividends to stockholders below the prevailing return in other companies for a series of years, and also from profits on long time investments, and through premiums on some of its capital stock issues. To be conservative and lay a foundation for continued growth, the stockholders were willing to relinquish a portion of the profits over a term of years, and in this way the Pennsylvania System in seventy-two years invested in its railroad property for public use about $430,000,000 in excess of its capital issues held by the public. This undercapitalization explains why the parent company has been able to continue its 6 per cent dividends despite such low returns on the property investment. The increased cost of living has always been recognized for the employees and for the producer of materials of which the railroads are large consumers, but the railroad stockholder has often been neglected, and his conservatism has been used as a basis to keep rates down, instead of allowing them to be reasonable.

Rate Reductions Under Private Management

I would further point out that, under no system of government ownership, guarantee or control, have there been reductions in rates equal to those made by our company and others under private management and initiative and prior to the enforcement of punitive laws and regulations. In 1864 the average revenue per ton mile on the Pennsylvania Railroad was about 2.5 cents. Due to the traffic development and continued efficiency, the average revenue per ton mile was reduced from 2.5 cents in 1864 to 1.3 cents in 1874, and in 1884 it had been reduced to 8 mills per ton mile. By 1894, as a result of commercial depression and competition, it had been reduced to 5.85 mills per ton mile, and later, through ruinous competition between all the railroads, fell to a very unreasonable and unremunerative basis. Yet, notwithstanding greatly increasing labor and material costs, taxes and other expenses, the average ton mile revenue received in 1894 was not again permanently reached until 20 years later, in 1914. Compared with similar charges abroad we begin to see the moderate revenues for which our railroad service was rendered.

While the trend of public opinion is now unmistakably opposed to government ownership as a solution of the railroad problem, there is much discussion of the possibilities of a government guarantee of railroad income, and if the income is guaranteed in substance, the principal of bonds must be paid at maturity, if not previously scaled down through government valuation. The railroad investor—so badly frightened by punitive laws and regulations and small profits—is willing to listen to any reasonable plan, whereby he can have a guarantee, hoping that he will have no more serious fluctuations in the price of his securities, and will be assured of a fixed income. He is not given the value to be placed on his individual investment on which the guarantee is to be based, nor the income to be guaranteed. He knows nothing of the division that is to be made between the various classes of securities of his railroad, nor the standing that is to be given to the various liens on his railroad property, and consequently does not know what is to be the final value of his securities, or whether he will finally get any return thereon at all. That knowledge, if it had to be conveyed beforehand, would be a serious eye-opener to the railroad investor. He should know it beforehand or he is taking a step in the dark.

Effects of a Government Guarantee

A governmental guarantee would plunge the country into a wholesale financial reorganization of the railroads extending over a period of years, and would ultimately mean government ownership. But to temporarily palliate the situation, the guarantee is to be coupled with private operation. What is to be the capitalization of these private operating corporations? Are they to be mere shells with no large financial stake in the properties they operate and administer? Is there any business man present who would recommend the government to guarantee returns on property having a value of about eighteen billion of dollars and turn it over to six, or even eighteen, private operating companies without demanding the power to thereafter define its financial and operating policy? Can any stock or bondholder imagine that our government will guarantee railroad stocks and bonds, and charge nothing for that guarantee? Should capital improvements thereafter be made according to the business necessities or on the political judgment of each administration? Would political favoritism as to new improvements, branches and extensions, and orders for supplies be inevitable in the government guarantee plan? Should we then employ officers and men who have political influence? Should we impose this guarantee plan on the country in the midst of the great struggle she must meet to reconstruct her industries and put national affairs and taxation on a peace basis? What period do you think it would take to work out the financial reconstruction of all the railroad systems of the country, and all their leaseholds, guarantees and other obligations, and what is to occur meanwhile?

These questions open up some of the problems of a guarantee. Why, even the Railroad Administration's federal control contracts, that deal only with the parent companies, and are based on the earnings for the three years ending June 30, 1917, remain in large part still unexecuted, and many vital questions and settlements thereunder are still untouched, although it is the ardent wish of the Administration to dispose of them.

Now, selfishly, the investor might take a 4½ per cent guarantee for his railroad security, and let the country take over his problem, but he must look further and realize that as a citizen and taxpayer he would be called upon to pay, in taxes and in the greater transportation costs upon production, his share of the extra cost of the government guarantee and administration, so that the net result to him of the guarantee plan would not better his condition.

What is the advantage of the guarantee plan to the private citizen who is not a railroad security holder? Those who support it admit that private ownership and initiative under equitable regulation produce the most efficient and economical operating results.

On top of that annual guarantee on about eighteen billions of dollars of existing railroad property, from six hundred million to one billion dollars more would be required annually for additions and betterments to the roadbed and equipment.

Now, the chief advantage emphasized for the guarantee plan is that the government could raise new capital cheaper than private corporations, and that by various schemes of regional unification the weak roads could be tied to the strong, further economies effected, and some element of competition left. Now, we know that reasonable competition as to service and attracting traffic is the best method of keeping up the standards and accommodating the public and enforcing economies, but there must be some appealing force to assure such reasonable competition, and the guarantee plan on its face does not seem to possess that force. I agree that the government could probably raise new capital much cheaper for a time than the majority of the railroads, but the savings obtained in that way would be easily obliterated by extravagance and lack of concentrated and continued responsibility under the government guarantee plan with our form of government.

Under the federal control contracts the government allows 5 per cent on deferred rental payments, and 6 per cent on new capital expenditures. This, in substance, shows that the government financing can become just as costly as that of the conservative corporations. We have also seen the strongest nations selling bonds at rates as high as those allowed by private corporations. Even so able a man as Paul Warburg, in suggesting a very attractive guarantee plan, has this to say upon the subject as the result of his long experience, both in private and government finance:

> "It has been argued that through the use of the Government's credit, railroads would procure the necessary funds at a lower rate of interest. As against that, we must remember that the excessive use of the government's credit tends to increase the rate at which a government borrows. With us it would not only affect the rate of the government bonds to be issued in refinancing the outstanding railroad securities, estimated at $17,000,000,000, but it would add to the rate to be paid by our government when some of our liberty bonds in due course mature and come up for renewal. Moreover, the incessant use of government bonds, in order to finance the annual requirements for future railroad developments and improvements, would have a disastrous effect upon the price and standing of our government securities. Granting, however, that some economy could be secured by substituting the government borrowing power for that of the railroads, it would be insignificant when compared with the increase in cost of operation and waste and inefficiency that inevitably would follow government operation."

Shall we, in order to save some small difference between the rate which the railroads would pay and the rate the government would pay on new capital, incur the risks of a guarantee plan? Shall we try to effect a saving in that part of the railroad dollar used to pay interest and dividends that represents less than 20 per cent of the whole dollar and at the outset admit that expenses of operating and other expenses (already requiring 80 per cent of that railroad dollar) when subject to government dictation, would increase rapidly?

Guarantee Plan Means Government Ownership

Let us try to depict the situation in any year when the income earned was less than the guarantee. How would the deficit be made up? Congress would have to appropriate the money out of the public treasury and raise the funds by public taxation. If the deficiency ran through several years Congress would be obliged to make repeated appropriations from the public funds to the railroad companies. Instead of getting the ralroads out of politics we would probably be making them the major issue in national politics. It is difficult now for the government Railroad Administration to get from Congress the funds needed to meet the government obligations to the roads when the government is in complete charge of operation and is collecting and disbursing the revenues. What would be the situation with eighteen railroad companies in full charge of the operations and the revenues, and the government called upon to make good their operating deficit? Bitter partisan attacks would be made on the corporate management for their failure to earn their minimum standard income, and demands in Congress for investigation of alleged extravagance and inefficient management and waste of the peoples' money given to the railroad bondholders and stockholders.

To my mind the guarantee of railroad income by the government would inevitably lead to government ownership—first of the weak lines, and later of all the lines. It might be argued that the government, instead of paying funds out of the treasury to the less prosperous companies, would advance the rates. But this again, it seems to me, would lead to the same sort of bitter political debate and attacks on the corporate management. It would probably be alleged that these weaker roads, knowing that their income would be provided by the government in any event, were purposely failing to do their best.

American industry has made its wonderful progress because the industries, and the men conducting them, have been rewarded for efficiency and penalized for inefficiency. It is the fear of failure as well as the hope of reward or commendation that incites men to do their best. A government guarantee on private capital invested in transportation would to a large extent remove the fear of failure, but would it be in the public welfare, or be helpful to our industries, which pay freight rates? If the government could keep rates at a level that would provide sufficient revenues for all roads to earn their guaranteed income and operating expenses, why can we not equally assume that the government will allow such adequate rates under a system of government regulation, stimulated to economy and efficiency by private ownership and initiative, and without the blight of a government guarantee?

The guarantee is not a solution of this great economic question, but a patch upon it.

Rehabilitation of Railroad Revenues Should Begin at Once

Don't let us get frightened about the task of rehabilitating railroad credit or imagine that it is an impossible task. It is entirely possible if we approach it with the proper methods and with equitable legislation. We had a Civil War—its cost was heavy. Compared with the aggregate wealth and position of our country, each citizen had more national debt per capita than we now face. We met the cost and it was our pride to steadily reduce our national debt. Following the war period the railroads and the country expanded, and laid the foundation for the greatest progress the world ever saw. It had some pains and sacrifices, and we cannot escape similar experiences. It is the price of liberty and progress. We had weak railroads after the Civil War, but we had a fair chance to conduct the railroad business and other industries. The Pennsylvania Railroad had ton mile revenues of about 2½ cents, so that it could pay its taxes, expanded its property, and lease or acquire weak roads even in the war period. It did this, and gradually reduced the rates as its business justified, and its solvency was assured. If the roads are allowed reasonable rates to properly support the railroad investment and service, and these rates are accompanied by constructive regulation, the credit of weak roads will, like that of so many weak roads in the past, be built up gradually by the growth of the country without taxing the public treasury or breaking down the few fairly strong roads. They will also be helped by ability to co-operate in the use of service and facilities with the strong roads, and adapt their capital and operating outlays to their necessities.

The root of our difficulty lies in weak railroad credit, and Congress must by legislation place the welfare of the public,

which is so intimately intertwined with the transportation systems, beyond the powers of any state or federal commission to disrupt the entire transportation system and investment. The way to do this is by a statutory rule that will insure adequate rates, and responsible regulation. Without such action there can be no railroad financial rehabilitation.

I suggest that the first step in the program of having the roads produce an adequate return upon the investment should be taken by the government itself which now has control of the railroads. There is no justification in throwing the railroad deficiencies on the backs of the taxpayers through a congressional appropriation, and if the government itself, in the control of the properties, has not sufficient courage to deal with the rate situation as it has dealt with wages and material costs, then from what source can we expect the requisite courage to deal with this great business and financial question? While wages and material costs are high, that adjustment of the rate structure to existing conditions should be the first constructive step in railroad financial rehabilitation, and constitutes a necessary preparation for the return of the railroads to their owners after appropriate legislation. The railroads of most countries face huge rate increases compared with the ante-war period, and our necessary increases being smaller than theirs will not place our industries at any disadvantage compared with those of other war-burdened countries.

Conclusion

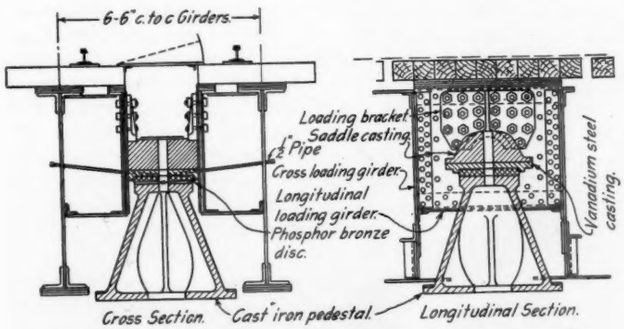
I conclude that the immediate remedy for the railroad situation is

1. Adequate revenues on which the railroad credit may be strengthened and the new capital attracted;
2. Concentrated, responsible national regulation, separated as between its executive and administrative functions, and its judicial functions, and founded on equitable legislation, that will require our regulators to insure strong transportation systems, and not weak railroads;
3. All railroads under public regulation to be authorized to lease, acquire or consolidate with any other railroad corporations, and reasonable co-operation permitted in facilities, equipment, and train service;
4. Regulation of security issues;
5. Regulation of wages, with the employee, the employer and the consumer represented;
6. Funding of the capital debts incurred during government control.
7. Rehabilitation of revenues of the existing railroads should begin immediately while they are under government control.

New York Central Turntable Has Unique Features

A Recent Design Has New Type of Disc Bearing Center and Heavy Wrought Steel End Trucks

A CENTER BEARING of the flat-disc type with a new form of rocker saddle and forged steel end trucks of heavy design are novel features embodied in a 100-ft. turntable recently developed by the New York Central Western Lines. Some of these features are an elaboration of ideas developed on a 90-ft. turntable which has had extended use at a number of engine terminals on this road. The table is exceptionally heavy, being adequate for a New York Central 0-8-8-0 Mallet locomotive weighing 480,000 lb., balanced over the table, or a Coopers E-70 loading for the single spans. The circular wall is provided with a large inspection pit (6 ft. square by 6 ft. 9 in. high) and a jacking base is introduced on the circle wall footing directly in front of the inspection pit and also circumferentially opposite so that the table may be jacked up for a more thorough inspection or for the replacement of the end trucks.



Arrangement for Applying the Loading to the Center

Of particular interest are the reasons given for adopting the disc type of center. Briefly, continuous service and low maintenance cost are more important than ease of turning and therefore low operating cost. It has been the experience on this road that under present heavy loadings the roller centers used have been too highly stressed, causing rapid grinding and wear of both rollers and treads with the result that replacement has come too soon. It has also been found that the roller centers used have required more frequent and careful inspection and maintenance than they have received from the roundhouse forces, with the result that their operation was not satisfactory. While the roller centers unquestionably turn easier than the disc centers when new, it was found that poorly-maintained roller centers did not turn as easily. Tests made by this road on a number of its turntables several years ago and which are recorded in the Proceedings of the American Railway Engineering Association for 1916, page 141, confirmed this position. Briefly, with electric power costing 4 cents per kw. hr. and the roller center in first-class shape the cost for turning an engine weighing about 486,000 lb. is one-quarter of a cent, while if the center is in poor condition the cost might run as high as 0.6 cents. For the flat disc center 24 in. in diameter the cost is about 0.57 cents. On this basis the cost of turning 100 engines in 24 hr. would be $0.57, while the cost per month would be a little more than $17. In other words the cost of operating the turntable, even with a center affording increased resistance, is small compared with the cost of operating the engine terminal.

In connection with the turntable, special attention has been given to the requirements of the tractor. It was felt that it is a serious mistake to provide a tractor of too limited capacity, for with it out of service 15 to 20 men may be required to turn the table. It is believed that with proper attention to this subject there is no more occasion for tractor failures on turntables than for failures of the motive power on movable bridges. The tractor required for these 100-ft. tables is specified to provide a tangential pull of 1,725 lb.,

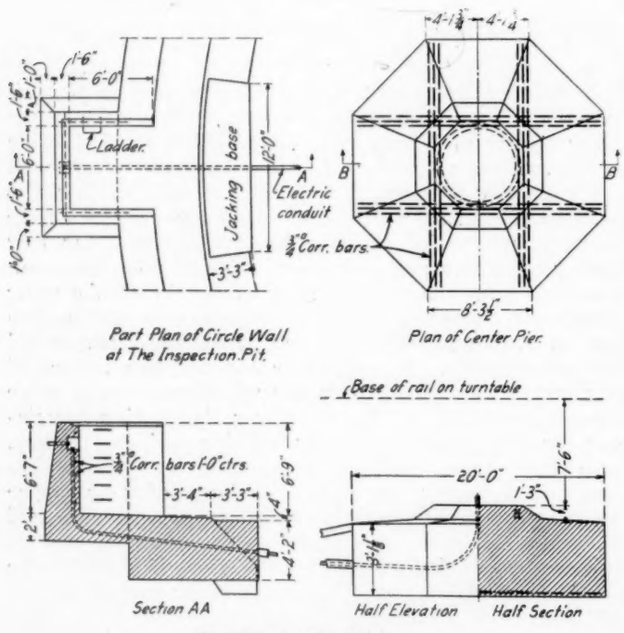
this being the initial friction estimated for a total load on the center of 842,000 lb.

The New Center

The disc of the center is flat and has only one rubbing surface. A vanadium steel bearing casting is attached to the under side of the turntable saddle and this bearing casting turns on a flat phosphor-bronze disc two feet in diameter which is attached to the center pedestal. The vanadium steel bearing is attached to the saddle casting by bolts while the disc is secured against turning on the pedestal by means of keys.

Special attention was given the manner of lubricating the contact between the vanadium steel and phosphor-bronze surfaces. Graphite grease is used for this purpose, being introduced into grooves cut in the surface of the vanadium steel through half-inch pipes leading from grease cups located outside the girders. Grease has been used because it was felt that for slow motions and heavy pressures a thick lubricant would be better than oil, since it has less tendency to be squeezed out of bearings.

The table is supported on the center through the use of a pin bearing. As seen in the drawing, the loading arrangement consists of two transverse loading girders connecting the two main girders, with two shorter longitudinal girders interposed between the two transverse loading girders. These two interior loading girders transmit the load of the turntable to the center through the aid of two brackets resting on trunnions forming a part of the saddle casting. As a consequence of this arrangement, the turntable may rock with

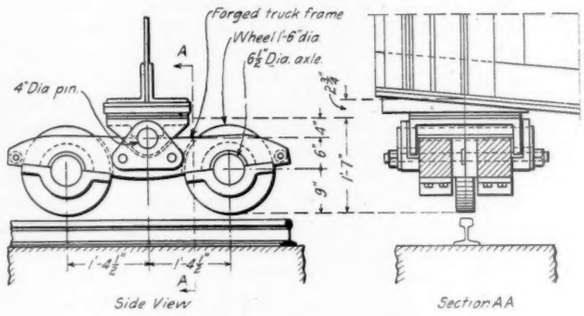


Details of the Masonry

the passage of a locomotive over it without introducing any eccentric loading on the center.

The forged steel end carriage is another interesting detail, an important feature being the articulating arrangement whereby an even distribution of the load on the two wheels is obtained. The truck frame is of forged steel made in two parts so that it may be bolted around the wheels. The middle of the frame carries a four-inch pin which takes the load from the girder in direct bearing through a cast steel shoe bolted to a bevel plate on the bottom of the girder. The shoe has a groove of 4 in. in diameter bored in its under side to fit over the pin, thus affording an effective rocker joint with a bearing 1 ft. 7 in. long. The wheels are of cast steel 1 ft. 6 in. in diameter and 4 in. thick with forged axles 6½ in. in diameter.

The table was designed for unit stresses not to exceed 12,000 lb. per. sq. in. in tension or compression with other stresses in proportion. For designing the end trucks and connecting parts the maximum end reaction was increased by two axle loads of 70,000 lb. each. When the table is

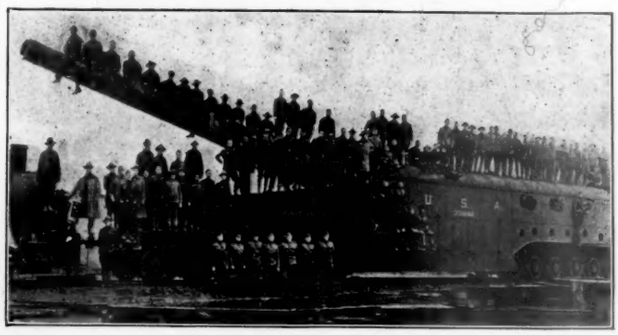


The New End Truck

moving the end trucks were considered as carrying an unbalanced load of 80,000 lb. on one end of the table. Provision was also made in the design for an end thrust of 20 per cent of the total live load on the table.

The total weight of the turntable is 171,927 lb., of which 145,720 is structural steel in the girders and cross frames, etc., and 26,207 lb. in the special castings, forgings, bolts, etc. The design of this table was developed under the direction of B. R. Leffler, engineer of bridges, New York Central Lines West of Buffalo, at Cleveland, Ohio.

The Black Tom disaster in New York harbor, on July 30, 1916, is the subject of a lawsuit which is being tried in Jersey City, N. J., this week, wherein 200 witnesses have been called. The case is the suit of the Bethlehem Steel Company against the Lehigh Valley Railroad to recover $2,900,000 for munitions destroyed in the explosion and fire. The suit is in the Supreme Court of New Jersey, in which court, a jury, in a similar suit a few weeks ago, awarded damages of $413,390 to B. H. Howell Son & Co., sugar refiners, for sugar lost in the fire. The defense of the railroad company was that the fire started on property not owned by it.



U. S. Official Photo, from U. & U., N. Y.

One of the 14-inch Naval Guns at Bassons, Gironde, France, Prior to Its Being Taken to the Shop to Be Dismounted for Its Return to the United States

Hearing at Washington in Railway Mail Pay Case

Revenues Steadily Decreased Under Space System—New Basis and Higher Rates Proposed

THE HEARING before Attorney-Examiner George N. Brown of the Interstate Commerce Commission in the railway mail pay case, which has been in progress at Washington since the first week in April, was concluded this week. The commission is to render a decision fixing reasonable rates for the transportation of mail by railway and prescribing the method or methods, by weight, or space, or both, for calculating the compensation of the railways for carrying the mail and the service connected therewith. If the decision of the commission shall be adverse to the space system now in effect, or if the rates established by it shall be greater or less than those now in effect, the postmaster general is required by law to readjust the compensation of the carriers from the date on which the present rates became effective, November 1, 1916.

Both the railways and the post office department have submitted voluminous testimony, and both have submitted plans representing their ideas as to the proper methods of compensation for the transportation of the mails, that of the department providing for a continuation of the present space system, with some modifications, and that of the carriers providing for a combination of the space and weight systems and greatly increased rates.

The case has its origin in the law passed by Congress at the instance of the post office department on July 28, 1916, which provided tentative rates for mail transportation, based on 21 cents per 60-foot car mile, subject to review by the commission, and authorized the postmaster general, pending the decision of the commission, to pay the carriers on the basis of the new rates by space, on such routes or systems as he should select for a test. Meanwhile the former method of paying on the weight basis was to remain in effect. The post office department, however, selected practically all of the routes for such "test" and put the space system in effect on November 1, 1916. Although for a short time the compensation of the railways under the new basis was increased at the rate of about $2,000,000 a year, the department began reducing the amount of car space used in such a way as to reduce the annual railway mail pay from a maximum of $62,750,551 in 1917, to $53,502,591 in 1918, although the volume of mail was greatly increased. Although a few mail trains were taken off during the war, the railways saved very little in operated mileage, and it is not denied that the reduction in mail pay was the direct result of the reduction in the authorizations of space under the new system.

One of the ways by which space has been saved has been to reduce the amount of mail handling on the cars and to send it as storage mail, to be sorted at the terminal upon arrival, thereby gaining the advantage of the heavier loading in the storage car.

The post office department has always claimed that the method of paying for mail transportation on the basis of authorized space afforded a more equitable plan for measuring the service performed, while the railways opposed it both as to the railroads as a whole and as a means of distributing the compensation among the different railroads. They now contend that the roads which carry the greatest density of mail traffic have been penalized both in the rates and by the consolidation of a greater volume into the space used, with a consequent reduction in pay greater than the saving in expenses, while the roads of lighter traffic have been penalized because the car space necessarily run is not fully used and paid for by the department.

For the purpose of presenting the case to the commission the month of April, 1917, was selected as a test period, and on all the roads the service was measured both on the weight and the space basis. The basic statistics thus determined have been agreed upon by the carriers and the post office department; but different conclusions have been reached from them because the post office takes the position that it should not be charged with any space but that authorized, except in mixed cars, while the railroads take the position that all of the cars necessarily run in order to furnish the authorized space should be paid for by the mail service. For example, a 60-foot car is run from Chicago to Omaha. From Chicago to Creston, Ia., a unit of 60 feet of space is required and authorized, but from Creston to Omaha only a 30-foot unit is authorized, because some of the mail has been put off at Creston. The car is run through to Omaha and the railroads claim it is done necessarily and should be paid for, but the department claims that the movement of the empty 30 feet of space is "for the convenience of the railroad" or is incidental to the passenger, baggage or express traffic. Approximately 31 per cent of the car space which the railroads find it necessary to operate is not covered by authorizations; and the post office not only has not paid for it, but at the hearing objected to its inclusion in the cost studies, except as to mixed cars.

The railroads also contend that the space system lends itself to other one-sided interpretations of the law, such as holding the authorizations down to an unreasonable minimum and making frequent emergency authorizations; authorizing small units of space for mail to be divided among several routes at a junction point and thereby requiring the railroad to haul a car for each route; failure to pay adequately for empty return trips, etc. The law provides for authorizations of space in units of 3 feet, 7 feet, 15 feet, 30 feet or 60 feet, but in making emergency authorizations the department has adopted the practice of authorizing multiples or combinations of such units in such a way as to save a few feet, as by authorizing two 3-foot units instead of one 7-foot unit, or two 7-foot units instead of 15 feet, although the railroad may have to furnish the larger amount of space.

The roads also claim that the space system is theoretically unsound and does not compensate fairly for the service rendered. They say that under the present system mail is carried in storage or baggage cars on passenger trains for less than freight rates, and less than the railroad's proportion of express rates.

Mail Rates Less Than Freight

Traffic men appearing as witnesses at the hearing produced elaborate detailed exhibits to show that to a great extent the railroads are being paid less for hauling storage mail in passenger trains than for merchandise freight in freight trains. It was testified that on the petition of the postmaster general the Interstate Commerce Commission had authorized a rating of first class for carload freight shipments of stamps and postal cards, but that since the establishment of the space basis the department has withdrawn such articles from the freight and is now sending them by mail in storage cars for less money.

For the purpose of comparing the revenue on parcel post traffic, a crate the size of a 3-foot unit of car space was taken to the plant of Sears, Roebuck & Co., Chicago, and filled with packages ready to mail. The crate held 874

pounds, or 146 packages averaging 6 pounds each. Assuming shipment for 17 large cities to various destinations approximately 50, 100, 225, 450 and 650 miles distant, and from Chicago to the 30 largest cities in the United States, it was shown in one of the exhibits that the average revenue when carried as closed pouch mail was $7.79, and when carried in storage space $5.11, but that if carried, under rates in effect in January, 1919, as one shipment of 874 lbs., the revenue would have been $10.30 if carried as express, or $9.12 if carried as freight.

The case for the railroads was prepared by the Railway Mail Pay Committee, Ralph Peters, New York, chairman, and was presented under the direction of its legal committee, F. H. Wood, of the Southern Pacific, chairman. Mr. Wood conducted the examination for the carriers with the assistance of other members of the legal committee, which includes Clyde Brown (N. Y. C.), New York; Kenneth F. Burgess (C. B. & Q.); H. W. Bikle (Pennsylvania); W. A. Cole (B. & M.); C. B. Northrup (Southern), and A. P. Russell (N. Y., N. H. & H.). The case for the post office department was directed by Joseph Stewart, special assistant to the Postmaster General.

The carriers' presentation was opened by testimony of traffic witnesses, D. M. Goodwyn (L. & N.), for the Southern carriers; P. C. Sprague (P. C. C. & St. L.), for the Eastern roads, and L. C. Mahoney (C. B. & Q.), for the Western lines, who presented voluminous statistics showing that present railway mail pay per gross ton-mile is far below first-class freight rates, as of April, 1917, when the freight rates were much less than at present.

Probably the most comprehensive statistics of passenger train operating costs and revenues ever put together are included in a series of exhibits presented in this case by L. E. Wettling, statistician for the railroad committee. Operating revenues and expenses for passenger train service were computed for 140 Class I roads on two different bases, for the separation of expenses common to both freight and passenger service, the basis used by the post office department and the basis of road locomotive ton-miles. On the first basis passenger train operating expenses were shown to be 26.58 per cent of the total operating expenses and on the second basis 27.79 per cent.

After reducing the service to equivalent 60-foot car miles the operating revenues and expenses per 60-foot car were shown on the two bases as follows (cents per mile):

	Basis No. 1	Basis No. 2
Total passenger train revenue	25.9	25.9
Total passenger train expenses	19.7	20.7
Passenger revenues	27.5	27.5
Passenger expenses	20.3	21.3
Express revenues	22.1	22.1
Express expenses	17.6	18.5
Mail revenues	17.8	17.8
Mail expenses	17.8	18.8

Calculation of Reasonable Revenue

For all roads in the United States the average passenger train revenue per passenger train car mile in 1917 was 29.29 cents. From this it was calculated that the mail revenue per annum necessary to make the mail earnings per used car mile equal to the average for the calendar year 1917 would be $97,796,749, or 38.4 cents per authorized car mile. This was based on 252,195,309 car miles authorized as of March 27, 1917, plus .91 per cent of this amount for emergency authorization, a total of 254,490,286 car miles authorized; plus 31.2 per cent of the authorization to cover empty space, a total of 333,891,255 car miles. It was also figured that to pay expenses, taxes and a 7 per cent return on the investment devoted to the railway mail service in 1917, based on service and costs in April, 1917, would require an annual revenue of $93,981,267, or 36.9 cents per authorized car mile, on the basis of post office letter of instructions No. 504; and $98,895,819, or 38.9 cents, on the locomotive ton-mile basis. The mail investment, based on 9.1382 per cent of the passenger train investment, according to the first basis of apportionment was $443,629,626, and on the second basis it was $463,824,955. For the calendar year 1918, based on the service in April, 1917, and on the costs in November, 1918, the mail revenue necessary to pay expenses, taxes and a 7 per cent return on the investment would have been $121,675,988, or 47.8 cents per authorized car mile on the first basis and $128,304,700, or 50.4 cents per car mile on the second. The average revenue, based on the authorization of March 27, 1917, was 7.32 cents per ton-mile and 23.69 per 60-foot car mile; and based on the authorization of June 30, 1918, it was 5.91 cents per ton-mile and 23.68 cents per car mile.

One of Mr. Wettling's exhibits showed that the compensation for initial and terminal service for 174 roads in April, 1918, was 18.55 per cent less than in November, 1916, for regular service, while for emergency service it had increased 55.84 per cent; and the total pay for both line haul and initial and terminal service had decreased 14.64 per cent. Another exhibit showed the distribution of passenger, express and mail revenues for April, 1917, for all roads in the case as follows: Passengers, $55,401,359; excess baggage, $551,039; sleeping cars, $142,078; parlor and chair cars, $80,490; other passenger train revenues, $589,561; milk, $1,209,824; express, $8,315,260, and mail, $4,467,027. Of this last amount $4,397,040 was computed on the space basis and $69,986 on the weight basis.

Mr. Wettling also presented exhibits showing the excess service performed by the carriers in carrying the mails over that authorized.

A special exhibit for the New England group of railroads showed the revenues and expenses per 60-foot car mile on the two bases of separating expenses as follows (cents):

	Basis No. 1	Basis No. 2
Total passenger train revenues	39	39
Total passenger train expenses	26.6	27.5
Passenger revenues	42	42
Passenger expenses	27	27.9
Express revenue	31.1	31.1
Express expenses	24.8	25.7
Mail revenue	20.8	20.8
Mail expenses	25.4	26.2

On both bases each of the New England roads was shown to be losing money on the railway mail service.

Traffic Increases; Mail Pay Reduced

An exhibit presented by W. A. Worthington, vice-president of the Southern Pacific Company, illustrates graphically the disparity in growth between railway mail pay and that in other sources of railway revenue since 1900, when the Wolcott-Loud commission reached the conclusion that railway mail pay was not then excessive, and also the effect of the space basis in actually reducing the compensation for mails, notwithstanding the fact that while the space basis has been in force the volume of mail has been the greatest on record, as stated in the annual reports of the Postmaster General. Under the old weight basis there was an automatic decrease in the ton-mileage rate as density of traffic increased, yet the mail pay was also subjected to several reductions after 1907.

From 1900 to 1917 the railway mail pay increased from $37,315,725 to $62,750,551, but in the calendar year 1918 it had fallen to $53,502,591. Express revenue, however, was over four times as great in 1918 as in 1900, passenger and freight revenue were each over three times as great in 1918 as in 1900, and operating expenses in 1918 were over four times as great as in 1900. The operating ratio had increased from 64.65 to 81.25 and railway taxes were nearly five times as great.

In another exhibit Mr. Worthington showed that while the volume of mail as measured by total postal revenues had more than trebled, increasing from $102,354,579 in 1900 to $344,475,962 in the year ending June 30, 1918 (excluding $44,500,000 due to increased postage rates) the payments to

railroads had increased only from $37,315,724 to $56,418,781, and the total postal expenses, excluding payments to railroads, had increased from $70,424,543 to $260,788,020. The percentage of postal revenues paid the railroads was only 36.46 in 1900, but this had been steadily decreased to 16.38 in 1918. Meanwhile the percentage of postal revenues absorbed by expenses other than payments to railroads had increased from 68.8 to 75.7.

Mr. Worthington also showed that while freight revenues per train mile had increased from $1.65 in 1890 to $4.60 in 1917, and passenger revenues per train mile had increased from $1.08 to $1.70, the operating expenses and taxes per train mile had increased from $1 to $2.48.

For the Class I roads mail revenue in 1918 under the space basis was 13 per cent *less* than in 1916 under the weight system, while express revenue was 40 per cent greater, passenger revenue 46 per cent greater, and freight revenue 35 per cent greater. While operating expenses had increased 70 per cent, the operating ratio had increased 24 per cent, and the net operating revenue had decreased 27 per cent.

Another exhibit illustrates the monthly fluctuations during 1916, 1917 and 1918, in revenues from express and mail, the former being directly responsive to increases in traffic, while the latter was not only not responsive but actually declined as traffic increased, because no additional pay was allowed to the carriers as the load in the car became greater.

As of March 27, 1917, the total mail pay on the space basis (excluding closed pouch service) was $56,943,826, of which $43,705,001 was for R. P. O. service and $13,238,825 for mail storage car service, which represents over one-half of the mail ton-mileage. A total of 366,318,887 ton-miles of mail was handled in R. P. O. service and 411,317,318 in storage car service. The average tonnage per 60-foot car was 2 and per storage car 6.69, an average of 3.18 tons per car. The average pay on the space basis was 23.89 cents per 60-foot car and 11.93 cents per ton-mile for R. P. O. service and 21.54 cents per 60-foot car and 3.22 cents per ton-mile for storage car service. The average was 23.30 cents per car and 7.32 cents per ton-mile.

Greatest Reduction on Heavy Traffic Routes

The annual railway mail pay on the basis of a weighing in April, 1917, would have been at the rate of $69,546,909. The annual pay on the basis of the actual space pay as of April, 1917, was $60,498,840, a decrease of 13 per cent. On some of the principal roads, carrying the bulk of the traffic, the percentage of decrease was much greater. For the Union Pacific the reduction on account of the introduction of the space system was $1,192,277 per annum, or 40.2 per cent. For the Southern Pacific the reduction was 34.4 per cent. While the average space pay per ton-mile was 7.32 cents, it was as low as 3.82 in the Union Pacific, and it was 10.33 on the St. Louis-San Francisco.

An exhibit covering 17 of heavy traffic routes showed the average pay per ton-mile to be 4.09 cents, 9.03 cents for R. P. O. service and 2.8 cents for storage and closed pouch service. While these routes carry nearly one-half of the total mail traffic they received only 27 per cent of the total pay.

It was also brought out in connection with the exhibits that the increase in the ton-mileage of mail of 202.91 per cent since 1900, when the Wolcott-Loud commission held that the mail pay was not excessive, would have made the annual mail revenue for 1917 $98,640,000 if the rate per ton-mile had fallen 5 per cent, the same as the fall in the average freight rate per ton-mile; that it would have been $110,000,000 if the rate per ton-mile had risen 6 per cent with the average passenger rate; that it would have been $141,440,000 if the mail pay rate had increased in the same ratio as express revenue, or $126,960,000 if it had increased in proportion to the passenger revenue; or $103,840,000 if there had been no reduction in revenue per ton-mile after the commission had made its report showing the rates not to be excessive.

Mr. Worthington presented a statement, made up from the records of the Post Office Department, showing that in the fiscal year ended June 30, 1918, the periodicals shipped by the Post Office Department on freight trains amounted to 50,971,929 ton-miles. The average haul was 883 miles; average railway pay per ton-mile, 1.518 cents; average load per car, 17 tons, and average railway pay per 40-ft. car per mile 25.88 cents. This would be equal to 38.70 cents per 60-ft. car.

The Carriers' Plan

Mr. Worthington also presented the carriers' plan for computing railway mail pay, under which about 40 per cent of the total compensation would be on the space basis and the remainder on the weight basis, and which it is estimated would produce an annual revenue of $95,034,182. This plan has been approved by the Railway Mail Pay Committee, the Railroad Administration, and the American Short Line Railroad Association. The plan is based on the fact that railway mail transportation in part represents the furnishing of traveling post offices which cannot be adequately paid for on the basis of the weight of the mails, and in part the hauling of mail in storage cars, for which the carriers declare that the space basis is neither fair to the railroads as a whole nor to the individual roads, because it gives no consideration to the loading of cars. Therefore the space basis is proposed for that portion of R. P. O. and apartment cars that is made up of distributing facilities and in which the weight carried is practically negligible, and the weight basis is proposed for storage mail and that carried in R. P. O. or apartment cars outside of the space devoted to distributing facilities. Under the old plan about 10 per cent of the mail pay was computed on the space basis.

The proposed space rates for the distributing facilities are based upon passenger train revenues per car mile and are, therefore, flexible, in that they may be changed from time to time as passenger train car mile revenues materially increase or decrease, should the Interstate Commerce Commission determine a change to be necessary.

A rate of 5½ cents per ton-mile was proposed as a proper rate for weight, to apply to about 97 per cent of the total ton-mileage. But, on the ground that such a flat rate, while applicable to storage mail, was insufficient when applied to light tonnage in apartment cars, closed pouch service, etc., and would not compensate for differences in the length of haul, the carriers proposed an initial rate of 45 cents per ton-mile for the first 100 miles or less on a line of road. This would increase the rate per ton-mile on the routes of light traffic density, and for the short line roads and would compensate for shorter hauls. For closed pouch service, which is used especially on the short lines and involves a great deal of labor for handling and much unused space, an additional service rate of 3 cents per train mile was suggested. The percentage of increase proposed over the former weight basis, because of the increased cost of operation, is 36.6 per cent.

The proposed rate of 5½ cents per ton-mile as applied to storage mail, with an average load of 6.7 tons and a tare of 50 tons per car, produces a revenue of 36.8 cents per car mile or 6.5 mills per gross ton-mile for loaded movement and 5.7 mills after allowing 15 per cent empty haul. The post office department in the year ending June 30, 1918, paid for the transportation of periodicals shipped by freight 7 mills per gross ton-mile, or 25.88 cents per 40-foot car-mile.

Following Mr. Worthington's testimony a number of mail traffic managers testified as to the practical administration of the space basis by the post office department; and representatives of the New England roads presented a request for

special compensation due to higher operating costs. B. M. Robinson, president of the American Short Line Railroad Association, testified on behalf of the short lines.

The carriers' plea in detail is as follows:

The rates proposed herein are submitted as basic rates predicated on conditions prior to January 1, 1918, and should be increased 30 per cent to absorb subsequent increase in cost of operation.

The transportation of the mail to be paid for on the following basis:

Rates for Weight Carried

The rates for all routes of all classes shall be as follows:

Forty-five cents per ton-mile for the first hundred ton-miles or less per mile of railroad per annum on each mail route, and 5½ cents for each additional ton-mile for each route

Service Rate for Closed Pouch Service

On short line railroads or branch trains of other railroads, and on other trains of other railroads not above designated, where there are no postal clerks on the train and the mails are carried in the baggage car handled exclusively by the baggageman, with record thereof at local stations, and the handling does not partake of the character of compact loading, as with storage mail for stowing in the baggage cars, an additional service rate of 3 cents per train mile shall be paid.

Method for Weighing

All weights to be taken for a period of 35 consecutive days, beginning with the second Tuesday in September of each year, or at such other representative period as may be prescribed, and a daily average for that period to be ascertained by the following method: readjustment of pay upon the rates prescribed to be made by the Postmaster General retroactively from July 1, of each year.

All weights to be taken at railroad stations by railroad employees where practicable; where their duties render it impracticable and the work of weighing shall require additional force, they shall be employed and paid by the railroad company after agreement has been reached between the Post Office Department and the railroad company as to the number of such employees necessary for that purpose.

The railroads to furnish trucks and scales at their expense.

The Post Office Department during the weighing shall have access to and supervision of the actual weighing under such regulations as may be prescribed by the Postmaster General.

The Postmaster General shall prescribe and furnish the forms upon which the weights shall be reported, and he shall make the necessary tabulations and computations and announce the average weights upon which payment shall be made.

The railroad companies may be furnished with duplicate reports by their employees, and shall be furnished with tabulated statements of the weights as computed by the Post Office Department.

Rates for Distributing Facilities

The linear feet of distributing facilities in postal cars and apartment cars, as now constructed under Post Office Department standards, shall be paid for at the following rates:

35-37 ft. distributing facilities, 17.8c. per car mile, provided in 60-ft. car.
30 ft. distributing facilities, 15.3c. per car mile, provided in 60-ft. car.
25 ft. distributing facilities, 12.8c. per car mile, provided in 60-ft. car.
17 ft. distributing facilities, 10.7c. per car mile, provided in 30-ft. apartment car.
14 ft. distributing facilities, 8.8c. per car mile, provided in 25-ft. apartment car.
11 ft. distributing facilities, 6.9c. per car mile, provided in 20-ft. apartment car.
8 ft. distributing facilities, 5.6c. per car mile, provided in 15-ft. apartment car.

For existing 70 ft. R. P. O. cars (40 ft. to 42 ft. distributing facilities) the rate of pay will be 20.3 cents per car mile. Space for distributing facilities, according to the rate scale prescribed, shall be paid for over the necessary operating run of car computed on a round trip basis, according to the maximum needed by the Post Office Department for distribution on such car run.

The foregoing rates are for railroad transportation service only, and do not include messenger or cartage service to and from post offices or to and from other railroad stations.

A differential of 33 1-3 per cent should be added for the New England lines, including Long Island, on account of higher operating cost.

Post Office Department Estimates

The Post Office Department introduced exhibits estimating the expenses of the principal roads for April, 1917, and after allowing a net income of 2.72 cents per car mile, as representing the rate which it said the railroads derive from express, arrived at a figure of $54,415,778 as a fair estimate of the total railway mail pay for a year, or 21.57 cents per 60-foot car mile. Applying 21.5 cents (and proportionate rates for various units of space) to the authorizations of March 27, 1917, produced a total annual revenue of $53,088,250.

The plan proposed by the Post Office Department for the continuance of the space basis contains certain modifications as compared with the present system, some of which were made during the course of the hearing as concessions to meet objections made by the railroads. The first witness for the department said that the space plan as at present operated was satisfactory, and he had only two changes to suggest, one to apply the system of using combinations or multiples of the space units to the regular authorizations as well as to emergency authorizations, and another to make separate contracts for side and terminal service. In the course of the rebuttal testimony the "improved" plan was submitted, eliminating the proposal for using multiple units. The proposed plan provides as follows:

Post Office Department's Plan

The space basis, as provided in the Act of July 28, 1916, shall be continued, subject to the following modifications:

Regular Authorizations

1. All regular authorizations for cars may be changed or discontinued at divisional points in accordance with the needs of the service; and for this purpose a divisional point is defined as one where the railroad company performs switching service in connection with passenger train service; but a change in an apartment car authorization may not be made at such point when the operating conditions of the train in question will not permit it.

Emergency Authorizations

2. All units of space needed to supplement regular authorizations of space shall be units of 3, 7, 15 or 30 feet, without duplication or grouping, and such units shall be discontinued, increased or decreased at any point where a fluctuation in the volume of mail carried permits of a change from one unit to another.

3. Whenever a regularly authorized unit of storage or closed pouch space, combined with an emergency unit, necessitates the use of more than 30 feet of linear space in a baggage or storage car furnished exclusively for the use of the mail, a 60-foot car will be requested of the railroad company and paid for on the basis of the round trip, provided it is not used by the carrier in the opposite direction.

4. Whenever a regular authorization is exceeded on 60 per cent or more of the trips during a period of 30 consecutive days, the next higher unit shall be authorized. This rule will not be applied in the month of December.

Undersize Cars

5. Where a railway post office car or any apartment car is deficient in length, but otherwise standard, it will be paid

for pro rata. In computing the pay for such cars the major portion of a foot will be regarded as a full foot. One-half of a foot or less will be disregarded.

DEFICIENCY IN STORAGE SPACE

6. Where a railway post office car or apartment car is of standard length, but deficient in storage space, it will be paid for pro rata in the same manner as cars deficient in length.

OVERSIZE CARS

7. Whenever an oversize car is furnished, storage units may be authorized therein on the basis of actual measurement.

SIDE, TERMINAL AND TRANSFER CARS

8. Where the railroad companies are required by the Post Office Department to perform side, terminal or transfer service, they shall be compensated separately from the line rate for such service (other than that performed in or directly contiguous to railway terminals and depots, unless otherwise provided for), in the amount paid therefor to contractors and for the value of the actual time of their employees while engaged in the carriage of the mails, including reasonable cost of vehicular service that may be necessary.

9. Where railroad companies contract for such service such contracts shall be let to the lowest responsible bidder upon advertisement.

10. Readjustment for such service shall be made annually and the companies shall furnish to the Postmaster General statements in detail showing the cost of the service rendered on such forms and in such manner as the Interstate Commerce Commission may prescribe.

MERGER OF RATES

11. The initial and terminal allowances shall be merged with the line rate.

The Progress of Electric Locomotive Design*

Knowledge of Design Essential to Intelligent Consideration of Electric Operation Possibilities

By W. B. Potter and S. T. Dodd
Railway and Traction Engineering Department, General Electric Company

A COMPARISON OF AMERICAN electric locomotive development with European, and particularly Continental, shows a characteristic difference in the method of transmitting the power of the motor to the driving wheels. In America the success attained with the many heavy high-speed motor cars, and the utilization of these cars in many cases for hauling trains, naturally led to the building of similar equipment for locomotive purposes only. This type of locomotive is the most economical design, but as the tractive effort is transmitted through the truck center pin, this type is commonly limited to a weight of about 60 tons. For heavier locomotives of this type, weighing from 60 to 100 tons, the two trucks are usually connected and the tractive effort transmitted directly through the trucks instead of through the locomotive frame.

The Continental designers, having had little experience with heavy motor car equipment, were skeptical of gearing and the practice of mounting motors directly on the axle. Their efforts have been mainly directed toward substituting the electric motor for the steam locomotive cylinder, retaining all of the side rods and adding a few more. There is a difference, however, between driving side rods from a steam piston and from a motor-driven crank, which does not seem to have been fully appreciated. In a steam engine the maximum stresses end-pin pressures, so far as the driving power is concerned, may be predetermined from the piston area and steam pressure. In an electric locomotive, however, having a motor-driven crank and side rods, the maximum stresses are influenced by variations in the wheel centers and the wear of bearings. The mechanical design must be strong enough to withstand the driving torque at a 45 deg. angle from the center, and at as much less angle as may result from the variations. As an extreme illustration, with one side stripped and the other on dead center, the stresses would be in excess of any practicable design.

The Continental locomotives show many variations of the side rod drive, both with the jack cranks direct driven by the motor through parallel rods or by means of gearing. Comparing only the most important trunk line electrifications in Europe and America, we find that out of nine European railroads operating 210 locomotives, there are represented 28 different types, while out of 14 American railroads operating 364 locomotives only 21 types are represented. The cause for this difference is to be found in the historical development which we have sketched above and in the fact that the American development has largely been determined by commercial reasons.

The design of American locomotives for slow-speed freight and passenger service has been influenced largely by the heavy motor car with motors geared directly to the driving axle. A gearless motor which could develop as tractive effort a proportion of the weight on the axle comparable to the geared motor would furnish a still simpler design. Recent developments along this line indicate the possibility of such a gearless slow-speed locomotive at a comparable price.

The design of electric locomotives for high-speed passenger service at 60 to 80 miles per hour is a more complicated problem. A substantial saving through the elimination of turn-tables and incident delays being obtained by designing the locomotive double ended and capable of running equally well in both directions, this desirable requirement involves features of design differing from that of a steam locomotive built for operation in one direction only. A feature in the design of a double-ended locomotive is to control the lateral oscillation and to minimize its effect on the track. This characteristic is more in evidence on tangent track where the flanges of the guiding wheels are free to move within the clearance, than on curves where the flanges of these wheels bear firmly against the outer rail. This characteristic also appears, though in a different form, in the single-ended steam locomotive, as the front and rear ends are not both subjected to the reactionary influence of two guiding trucks. In any event, the wheels at the front and rear ends of the locomotive must be relied upon to withstand the effect of these lateral oscillations.

In a double-ended locomotive, with guiding trucks at

*Abstract of a paper presented before the Western Railway Club April 21.

each end, any lateral oscillation will deliver a thrust at the truck center plate both at the front and rear ends. The roll of the locomotive body has little tendency to transfer weight to the outside guiding wheels and, therefore, has but little effect in holding down the outer rail. The lateral movement of the locomotive, however, does increase the weight transferred to the outside guiding wheels in proportion to the height the center plate is raised above the rail head. The problem presented is to design a double-end locomotive with leading and trailing trucks, which shall have sufficient guiding force for the front end and with such characteristics as to minimize the cause and effect of lateral oscillations.

To minimize the cause of lateral oscillations the front and rear trucks should be restrained so far as possible from any individual movement, other than that essential to proper guiding of the locomotive. Experience has demonstrated that a two-axle truck with an articulated connection accomplishes this desired result much more effectually than either a two-axle bogie or pony truck. To minimize the effect of lateral oscillations the characteristics should be such that the truck will allow a time element during delivery of the thrust against the rail head and such that any lateral thrust at the center pin will produce a large vertical component at the outer guiding wheels. Raising the bearing point or center plate of guiding trucks to 60 in. or 70 in. above the rail head has shown by tests that these characteristics can be obtained in that manner. What we wish to do is to direct attention to the fact that a successful double-ended high-speed locomotive can only be obtained by a proper study of the front and rear trucks.

For high speed passenger service with speeds of the order of 60 to 80 m.p.h. if a locomotive is equipped with geared motors the gear reduction approaches a small ration, if the armature is to be kept within practical rotative speeds. This presents all the disadvantages of increased weight due to gears with their cost of maintenance without the compensating advantage of the increase in tractive effort usually gained by gear reduction. Consequently, it appears to us that for such speeds and for such service the gearless motor with the armature mounted directly on the axle presents the best solution. The bipolar gearless motors on the New York Central Railroad, which have been in service for twelve years, have shown very low maintenance costs.

Collection of Current

The trolley pole and wheel which has so well served the electric railway is not well adapted for the heavy service we have been considering, nor is it a convenient device for movement in both directions. The pantograph collector, which requires no attention on reverse movement, has long been used, but it is only within the past few years that its capacity as a collecting device has been fully demonstrated. Rolling and sliding contracts have both been tried, with results distinctly in favo rof the sliding. The wear of the working conductor or trolley wire is due far more to the destruction by arcs at the point of contact than from the mechanical friction, hence it is most important that the wire be so supported as to eliminate any rigid spots which are the usual cause of this arcing. The wire should be lifted slightly and really supported by the collector rather than that the collector should run underneath a wire held in rigid relation to its support. Lubrication of the collecting surface not only reduces the wear but seems to slightly improve the contact, presumably because of less tendency to chatter than with bare metal. The amount of current that can be successfully collected seems limited only by the current capacity of the working conductor. Tests have shown no arcing at the contact with 3,000 amp. at 30 m. p. h., and 2,000 amp. has been collected with equal success at over 60 m. p. h. A copper conductor with copper wearing strips on the collector has been found to give the best results. Measurements taken on the St. Paul railroad indicate the working conductor will have a life of over 100 years before it will have to be replaced because of wear.

Regeneration

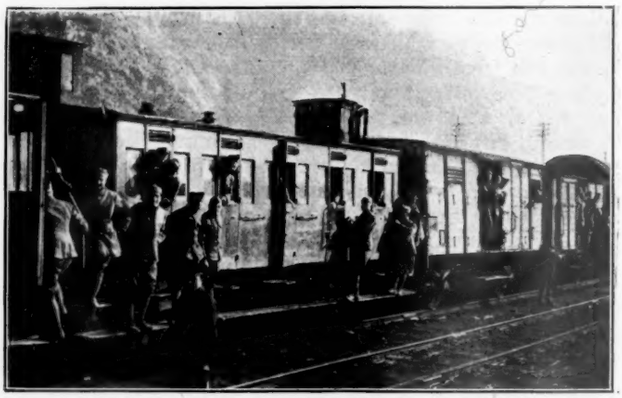
Regeneration as used in this connection implies the use of electric braking and the utilization of the energy in the train as electric power, which is fed back into the distributing system. The train on a down grade drives the motors as generators, which is comparable to the action of falling water in a hydro-electric power station. Regeneration is of special advantage in the long grades encountered in mountain districts. Grades of 20 to 50 miles in continuous length are found on almost all the railway lines crossing the continental divide. It eliminates the surging in the train and the variations of speed which are encountered in holding the train by air brakes. In addition to this, the wear of brake shoes is eliminated and the delays which are often due to overheated brake shoes on long grades are also avoided. The electric braking takes place entirely at the front end of the train, taking up all slack and permits the air reservoirs to remain fully charged in reserve for emergency.

The amount of power returned to the trolley by regeneration varies with the amount of the grade and the type of train. On specific tests it has been shown that a train on a 2 per cent grade has regenerated 42 per cent of the power required to pull the same train up the grade. On a 1.66 per cent grade 23 per cent has been regenerated. The records for a particular month over the entire Rocky Mountain division of the C., M. & St. P. for both freight and passenger trains show that the regeneration was equivalent to 11.3 per cent of total power used.

Conclusion

On locomotives for freight and slow speed passenger service it seems probable that the use of geared motors mounted directly on the axle will be continued. On locomotives for high speed passenger work the motors will presumably have some type of gearing or preferably be of gearless design. The characteristics of the guiding trucks in their design and method of attachment are important for high speed running.

We find that incidental difficulties in connection with operation of heavy service electrically are being solved. The collection of any reasonable amount of current from an overhead conductor offers no difficulty; while regeneration solves in a practical manner the problem of braking on long grades and returning the available power to the power system instead of wasting it in brake shoes.



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Arriving at Brest

Doings of the United States Railroad Administration

Three Months' Deficit $192,000,000; May Ask for Larger Appropriation; Rate Advance Deferred

WASHINGTON, D. C.

THE RAILROAD ADMINISTRATION is likely to ask Congress for an appropriation of $1,000,000,000 instead of the $750,000,000 which was lost in the filibuster of last session. The President has called Congress to meet in extra session on May 19 and its first work after organization will be to take up the necessary appropriation bills which failed of passage. While the Railroad Administration has not announced any change in its figure, it will be necessary to present its request anew and it is now engaged in a reconsideration of the various items that represent its needs for money and that will be shown in the new statement to Congress. As an additional deficit of $192,000,000 has accumulated in the three months since the figures on which its first request was based were made up, and as the April reports are liable to increase this by another $50,000,000 or so, while the revised returns for 1918 show the deficit for that year to have been $226,000,000 instead of $196,000,000 as estimated then, it is believed that a billion dollars is a conservative estimate, although the capital expenditures program has been curtailed by the lack of funds.

While there has been much discussion of the need for an advance in rates and most railroad men are inclined to the belief that such a step will be necessary, Mr. Hines has thus far deferred a decision on the matter until better information as to the probable results for the year as a whole is available. There is still hope that tonnage may be considerably increased later in the year and it might be a more propitious time to take up the rate question more definitely after an appropriation based on present and past conditions has been granted.

The passage of the appropriation bill will make it unnecessary to issue any more certificates of indebtedness after those applied for to take care of the present requirements have been issued unless the appropriation should be delayed.

The Railroad Administration has no other legislation to propose except the appropriation bill, but Congress is expected to take up at an early date the question of a permanent solution of the railroad problem and undoubtedly a large number of bills dealing with the subject will be introduced at the opening session.

Mr. Hines Explains Financial Situation

The aggregate deficit of the Railroad Administration for the first three months of 1919, after allowing for the rental due the railroad companies, the expenses of the Railroad Administration, the operation of inland waterways and some incidental items, was $192,000,000, according to a statement authorized by Director General Hines. This figure is reached, he explained, by comparison with three-twelfths of the standard return for a year, although the average net operating income during the three-year test period for January, February and March was less than that amount. Mr. Hines' statement did not give the figures for March, which show a net operating income for the Class I roads and the switching and terminal companies of $10,924,000, or 82.5 per cent less than for March, 1918. The three-year average for March was $68,251,000. For three months the net operating income was $39,813,000, as compared with an average for the corresponding months of the test period of $172,798,000, while three-twelfths of the standard return for a year for the roads under federal control would be about $232,000,000.

Mr. Hines also stated that practically complete returns for 1918 now show the deficit for the year to have been $226,000,000 so that the total deficit up to April 1, since the government took over the roads is $418,000,000.

The fact that his statement was somewhat less conservative than some previous financial statements of the Railroad Administration gave an impression that he might be preparing the public mind for an advance in rates, but he said it is now impossible to make any confident statement as to the results for the year as a whole and that his own judgment is that conditions are too abnormal to serve as a basis for any general change in the level of rates and that it is preferable to defer action on that subject until further information is available. The statement follows:

"I believe it is highly important to keep the public as fully informed as practicable as to the financial results of the Railroad Administration. Practically complete accounting for the calendar year 1918 has just been accomplished and tentative results for the months of January, February and March, 1919, have become available. I take advantage of the first opportunity after an extensive trip in the West to put a summary of these results before the public.

"The results for the calendar year 1918 show that at December 31, 1918, the deficit incurred by the Railroad Administration for that year after deducting the rental due the railroad companies amounted to $226,000,000. This included the expenses of the central and regional administrations, and also included the operations of the inland waterways under control of the Railroad Administration as well as the incidental and miscellaneous items which must be taken into account in a complete statement. There remained comparatively small amounts of back pay for the calendar year 1918 which were not charged into the accounts for that year but which have largely been charged into the three months ending with March, 1919.

"For the months of January, February and March, 1919, the aggregate deficit incurred, after deducting the rental due the railroad companies, was approximately $192,000,000. This figure includes not only the Class I railroads, but all other railroads under Federal control, the expenses of the central and regional administrations, the operation of inland waterways under control of the Railroad Administration as well as some incidental and miscellaneous items. In arriving at this figure there has been charged against each of these months one-twelfth of the annual rental for the railroads. Generally speaking, these three months have always earned much less than three-twelfths of the return for the year so that a substantially less charge of rental into these months would not be inappropriate. Still it seems preferable to charge a full one-twelfth of the rental into each of these months rather than to run the risk of an impression arising that there is any disposition to under-state the actual results. To a large extent the unfavorable results for January, February and March are due to the fact that business has fallen off and that expenses could not be correspondingly readjusted so that the loss largely arises in connection with the period of readjustment through which the country is going. Industrial enterprises generally have suffered embarrassment on account of the fact that business has been curtailed so much more rapidly than expenses could be curtailed. The railroad business is probably in its nature less elastic than any other business and shows more unfavorably the embarrassments of readjustment.

"Since the first of the year I have conferred repeatedly

with the regional directors and I have also conferred with nearly all the federal managers in the United States on the subject of costs. The entire railroad organization has been and is working most earnestly to readjust these costs to meet the present conditions, but the nature of the railroad business whether under private or public control is such that to a very large extent it is impossible to offset loss in business by a corresponding reduction in costs. On the other hand when there shall be a substantial increase in business the revenues therefrom will be largely reflected in the net because the costs will not be correspondingly increased. It is believed that this improvement will be considerably emphasized by reason of the fact that maintenance work has been carried forward during the favorable weather of January, February and March, on a liberal basis despite unfavorable business and this should be reflected in a saving in maintenance costs later in the year.

"While passenger business for the three months was only slightly less than last year, the loss in freight business was much more pronounced, as is shown by the following table:

TOTAL NET TON MILES IN THOUSANDS
(Revenue and Non-Revenue)

	1919	1918	1917
January	30,383,169	27,619,867	32,652,616
February	25,681,943	29,678,260	28,386,351
March	28,952,925	37,706,100	31,674,619

"The figures for 1919 are strictly comparable with those for 1918, but the 1917 figures do not include all the large roads in federal operation. In order to put all three reports on a conveniently comparable basis, the net ton miles per mile of road per day are given in the following table:

NET TON MILES PER MILE OF ROAD PER DAY
(Revenue and Non-Revenue)

	1919	1918	1917
January	4,275	3,878	4,770
February	4,002	4,591	4,511
March	4,059	5,273	5,192

"It is impossible on the basis of these three months to predict the results for the year as a whole, although it is believed the results will be very much less unfavorable if as seems to be generally anticipated there shall be an important resumption of business later in the year, especially if the great crops now in prospect shall be realized.

"On the trip in the West which I have just completed I have found the most pronounced optimism on the part of business and agricultural interests generally which gives a reasonable basis for hoping for an enlarged business that will be relatively profitable to the railroads since handling it should not correspondingly increase their costs. But while it is proper to mention these factors, it must be admitted that in the midst of the present period of post-war readjustment it is impossible to make any confident statement as to the results of railroad operations for the remainder of this calendar year.

"The present unfavorable results naturally lead to agitation of the question whether there ought to be an increase in rates. My own judgment is that the present conditions are too abnormal to serve as a basis for any general change in the level of rates and that it is preferable to defer action on that subject until there shall have been a fuller opportunity to get a more reliable, and possibly a more normal, measure of the conditions, meanwhile resorting to every practicable economy, studying the situation with the greatest care, and keeping the public fully informed as to developments.

"There has not been included in the months of January, February and March the sum of approximately $6,000,000 per month for back pay on account of wage orders recently issued to put into effect recommendations of the Board of Railroad Wages and Working Conditions which were made upon proceedings pending before it during the war, such wage orders being necessary as heretofore explained to complete the war cycle of wages to which the government was necessarily committed during the war. These amounts of back pay will appear in the next few months and of course will result in diminishing operating income for those months.

"One other item needs to be mentioned. Under the contract made between the government and the American Railway Express Company in the summer of 1918 the government undertook to assume any operating deficit which the express company might incur during government control. Such operating deficit for the first year will not be ascertainable or technically chargeable against the Railroad Administration until the end of 12 months from the effective date of the contract, i. e., July 1, 1918. The amount of this deficit, however, should be borne in mind. For the six months ending December 31, 1918, such deficit was approximately $9,500,000 and for the months of January and February, 1919 (including allowance for back pay to be hereafter paid on account of those months) it is roughly estimated that such deficit will be approximately $5,040,000, making the operating deficit now in sight for the first eight months of the year which will end June 30, 1919, approximately $14,540,000. It can reasonably be assumed that this additional expenditure will have to be incurred by the Railroad Administration on account of the eight months in question, although it will not appear in the accounts until after June 30 next. No estimate can yet be made for the month of March.

"It is not anticipated that the conditions for April will be more favorable than the conditions for January, February and March. In many parts of the country the effects of business readjustment were more pronounced in April than in the earlier part of the year.

"It is my policy to give the public the facts and, where the inference to be drawn is doubtful, to resolve the doubt in such way as to avoid the risk of making a statement more favorable than the ultimate facts will justify."

As compared with the three-year average for March, the March deficit was $57,327,000. In January the deficit was $37,830,000 and in February it was $37,828,000. Freight traffic declined very sharply in March, the net ton mileage being 23.2 per cent less than in March, 1918. The operating revenues were $376,345,000, an increase of 2.9 per cent, while expenses were $346,770,000, an increase of 22.2 per cent. Net operating revenues were $29,574,000, a decrease of 63.9 per cent. The Eastern roads had a deficit of $1,283,000, the Southern roads earned $4,489,000 net operating income, and the Western roads $7,719,000. For the first quarter of 1919 the operating revenues were $1,125,078,000, an increase of 37 per cent over the test period average, and operating expenses were $1,031,756, an increase of 81 per cent, while the net operating income $39,814,000 was 77 per cent less than the three year average.

Cash Transactions of the Central Administration

Director General Hines also authorized the following statement in connection with cash receipts and disbursements by the United States Railroad Administration treasurer at Washington, for the month of April:

The cash receipts from all sources, including payments of loans by the railroad companies, amounts transferred from railroad treasuries, collections from express companies, and payments on account of additions and betterments, aggregated $35,643,175.

The cash disbursements, including loans to railroad companies, payments to railroad companies on account of compensation, advances to federal treasurers, and payments to waterways and canals, amounted to $48,857,027.

Of the foregoing receipts, $20,276,500 represented amounts transferred from railroad treasuries to the central administration treasury, while $46,955,500 of the disbursements covered advances to federal managers. The net amount which it was necessary for the central administration to advance to federal treasurers for current requirements was, therefore, $26,679,000.

The total amount loaned the railroad companies by the director general for the 16 months of federal control ended April 30, 1919, was $232,349,459 and of this amount $61,399,250 has been repaid. All of the balance, practically speaking, can be deducted in settlement of the compensation, so that these items, while termed loans, can be regarded substantially as payments on account of compensation. The total disbursements on account of compensation and loans substantially of that character, aggregated for the 16 month period $494,913,615.

The total payments for standardized equipment during the 16 month period amounted to $163,950,402.

The above relates to the cash receipts and disbursements of the central administration, and does not include the receipts and disbursements of the federal treasurers, in connection with the operation of the properties under federal control, as these figures are not yet available.

The director general issued to April 30, 1919, certificates of indebtedness aggregating $148,883,234, of which $131,257,800 were on account of compensation to enable the various carrier corporations to meet their cash requirements, such as interest, dividends, and other corporate charges, up to and including May 1, 1919; and $17,625,434 were on account of amounts due the car and locomotive builders for equipment. These items are not included in the cash disbursements given above.

Demurrage Rates to Be Cut

The Division of Traffic of the Railroad Administration has advised the National Coal Association that the present demurrage rates will be changed at the earliest practicable date, and announcement of changes on the following basis is expected:

The rate will be $2 per day for the first four chargeable days after the usual two days' free time; for all chargeable days thereafter the charge will be $5 per day. The average agreement may apply on inbound loads separately and on outbound loads separately, but no credits will be allowed to be transposed from one operation to the other.

It is understood that the proposed recodification of the national car demurrage rules, in so far as it includes various changes, will be deferred until some future date, and that the rules now in effect will continue to be operative except as outlined above. The rules now in effect, and which are to be superseded by the new rates, provide that after the expiration of free time, the charges per car per day shall be $3 for each of the first four days; $6 for each of the next three days, and $10 for each succeeding day.

Mechanical Officers Instructed to Report on June Conventions

Frank McManamy, assistant director of the Division of Operation, has addressed the following to the regional directors, asking that mechanical officers be instructed to make written reports regarding their observations at the June conventions:

"The convention of Section 3, Mechanical, American Railway Association, which is composed of the Master Car Builders' Association and American Railway Master Mechanics' Association, will be held at Atlantic City, June 18 to 25.

"It is desired that the representative members from the different railroads attend, as far as possible, and that other mechanical department officials who are members be permitted to attend, for at least a portion of the time, where they can be spared from their regular duties without adversely affecting the service. It is anticipated that there will be on exhibition the most complete collection of mechanical appliances that has ever been exhibited at one of these conventions, and a study of it will be of substantial value to the mechanical department officers who are in attendance.

"In order to obtain the greatest possible amount of benefit from this convention, it is desired that each member present below the rank of superintendent of motive power shall, on his return from the convention, make a written report to the superintendent of motive power, relative to the new devices which he inspected at the convention, or ideas which he obtained from the discussions which can be applied with profit to the work under his direction.

"The superintendent of motive power will make a digest of the various subjects presented in this way, so that those which can be profitably adopted may be given consideration, sending a copy of it to the assistant director, Division of Operation, in charge of the mechanical department, for the use of the Committee on Standards for locomotives and cars.

"Will you please issue the necessary instructions?"

Freight Traffic Movement for March

The volume of freight traffic in March decreased 23.2 per cent, measured in net ton mileage, as compared with March, 1918, according to the monthly report of freight traffic movement and car performance compiled by the Operating Statistics Section. Net ton miles of revenue and non-revenue freight were 28,952,925, as compared with 37,706,100 in March last year. In the Ohio-Indiana district the decrease was 39.4 per cent, while in the Southern region it was only 8.6 per cent, but all regions show a decrease. Net ton miles per mile of road per day were 4,059 as compared with 5,273. Train miles decreased 22.4 per cent and total car miles decreased 18.6 per cent, while the percentage of loaded to total car miles was 68.1 per cent, as compared with 71.4 per cent. Tons per train fell off 1.2 per cent, from 666 to 658, and tons per loaded car from 27.9 to 27.6, a decrease of 1.1 per cent. The average number of freight cars on line daily was 2,432,469, of which 2,295,617 were reported as serviceable. The percentage of unserviceable cars was 5.6 per cent as compared with 5.1 per cent in March, 1918. The average mileage per car per day was only 20.4 as compared with 24.9 in March, 1918, a decrease of 18.1 per cent, and the net ton miles per car day were 384 as compared with 496.

Executives' Committee to Confer on Car Allocation

Following a conference last week with Swagar Sherley, director of the Division of Finance of the Railroad Administration, the Association of Railway Executives has appointed a special committee to confer further with the Railroad Administration on the question of the allocation to the various railroad companies of the standard freight cars ordered by the Railroad Administration. According to a recent report about 92,000 of the cars had been allocated and 45,000 had been built, but only 27,000 had been accepted by the railroads, 18,000 being in storage without stencilling. Efforts will be made to work out a plan to assist the companies in financing the equipment. No date for the conference has been set. The committee consists of the following: Thomas DeWitt Cuyler, chairman; Alfred P. Thom, counsel; Howard Elliott, president, Northern Pacific; Julius Kruttschnitt, president, Southern Pacific; W. H. Finley, president, Chicago & North Western; E. E. Loomis, president, Lehigh Valley; Charles Hayden, president, Chicago, Rock Island & Pacific; Mark W. Potter, president, Carolina, Clinchfield & Ohio, and E. P. Ripley, president of the Atchison, Topeka & Santa Fe.

Conference of Steel Prices

Representatives of the purchasing department of the Railroad Administration were to hold a conference with a committee of iron and steel producers at New York on Thursday to discuss the much-controverted question of iron and steel prices. The conference was arranged by the Industrial Board of the Department of Commerce, which, having failed to obtain the endorsement of the Railroad Administration for the scale announced on March 21, offered its services as a

mediator. The board itself was not to take part in the conference. It was understood that the Railroad Administration was prepared to offer the steel interests a compromise price.

Interest to Be Paid on Claims

Accounting Circular No. 41-A says that P. S. & A. Circular No. 41, issued October 29, 1918, seems to be unfair as to claims presented previous to November 1, 1918, and is accordingly amended by striking out paragraph 2 of the original circular and inserting in lieu thereof the following:

"2. In case of claims presented prior to November 1, 1918, interest shall be paid from the date of presentation. If settlement has been made during federal control upon a different basis, the claim shall be readjusted upon the interest basis here prescribed. In the making of payment fractions of the month shall be disregarded as is provided in paragraph 1."

Small Under or Over Charges May Be Ignored

Accounting Circular No. 87 states that in the course of collecting freight charges from shippers or consignees and adjusting disputed items to a correct basis many small errors occur which in the aggregate are not substantial, but the correction of which are both costly and annoying to the railroad and some of its patrons. In order that these petty differences may quickly be disposed of, carriers federally operated may enter into agreements with shippers or receivers of freight to ignore undercharges or overcharges of 10 cents or less on each shipment detected after freight bills therefor have been rendered. If patrons require the settlement of all undercharges or overcharges of 10 cents or less, all such differences must be settled with them. Care should be exercised to see that differences of this character are not intentionally created so as to result in an advantage to any interested person or concern. It is expected that the obvious benefits of the plan will commend it to all concerned, and that no difficulty will be experienced in making it effective.

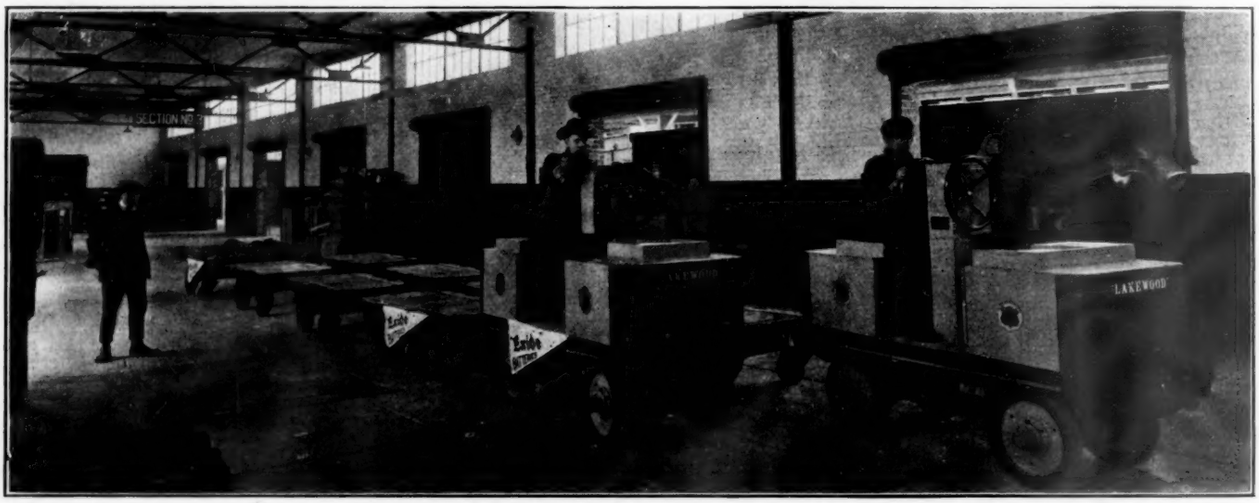
Contracts Executed

The Railroad Administration has executed compensation contracts as follows: Chicago Great Western, $2,953,449.94; Brooklyn Eastern District Terminal, $306,259.63; New Orleans, Great Northern, $575,951.79; and the Leavenworth Terminal Railway & Bridge Company, $43,583; also cooperative short line contracts with the following: Cumberland & Manchester; Alabama Central; Bartlett Western; Glenmore & Western; Kosciusko & Southeastern; Nevada Copper Belt, and Pittsburgh & Susquehanna.

Kanawha & Michigan Uses Electric Tractors and Trailers

THE NEW FREIGHT HOUSE of the Kanawha & Michigan at Charleston, W. Va., has been equipped with electric tractors and trailers for economy in the handling of package freight, both inbound and outbound, as well as to accomplish a general speeding up of freight house operations. The photograph illustrates the character of the equipment which was supplied by the Lakewood Engineering Company, Cleveland, Ohio.

The tractors are of the four-wheel-steer, four-wheel-drive type, operated by a 48-volt, 45-ampere motor (continuous rating), supplied with current by storage batteries. The motor is mounted on a longitudinal shaft with a worm drive on both axles. Among the distinctive features of the equipment is the short turning radius of 5 ft. 1 in., measured to the outside edge of the platform at the forward corner, which is of great advantage in handling the tractors and trains in close quarter. Another feature is the double-end control. The control equipment is mounted in a centrally located stand flanked at either end of the car by battery boxes, each fitted with a driver's seat. Thus the driver has the controller, steering wheel and safety pedal in convenient position before him no matter which seat he occupies. This feature is of special value in handling the tractors in narrow passageways.



Tractors and Trailers Used in the Freight House at Charleston, W. Va.

In connection with the steering and drive arrangement it is of interest to note that the power is transmitted from the axles to the wheels without the use of universal joints. Instead the transmission is accomplished by a train of bevel gears, using the vertical shaft which also serves to swing the wheel in steering. Power is applied to this shaft from a bevel gear on the axle and is transmitted from the shaft to the wheel by means of a second bevel gear of large radius mounted on the inner face of the wheel.

The trailers used at Charleston are of the caster type with main wheels 16 in. by 4 in. and caster wheels 8 in. by 4 in. and a weight of 720 lb. The carrying capacity is 5,000 lb. This type is particularly adapted to installations where it is desirable to do a certain amount of hand trucking. Another Lakewood type, the four-wheel-steer trailer tracks more accurately and has the further advantage that it may be hauled in either direction. Still other types of Lakewood trailers include a balanced type having a pair of 18-in. center wheels with two casters at each end, and a "fifth wheel" type for use on rough ground in cases where considerable hand hauling is done.

Railway Developments in Foreign Countries

Proposed Extensions in Peru; Suggestions for Trading With Greece; South African News

THE GOVERNOR of the state of Sao Paulo, Brazil, has temporarily authorized an automobile passenger and freight service along the route of the branch of the Campinheiro Railway from Joaquim Egydio to Dr. Laciada, in place of the present steam railway service.

Exports of railway material through the port of New York in March, according to figures compiled by the National City Bank of that city, included car wheels to the value of $197,573; steam locomotives valued at $779,099; steel rails amounting to $1,289,394, and steam railway cars valued at $427,378.

Discussion of Chinese Railway Unification Ceases

[Special Correspondence from Peking]

Public discussion of the proposed "unification" of the foreign interests in Chinese railways has ceased as suddenly as it began. In the meantime, the Japanese-controlled Chinese press contains almost daily articles dealing in innuendo against American motives in Korea, Siberia, and in world politics. The most pointed action has been the publishing of the Siems-Carey railway agreements simultaneously with a few of the more innocent Japanese secret agreements. The idea evidently has been to convey the impression that these American agreements were also "secret" when as a matter of fact they were given to the press two years ago.

Standard Specifications in Spanish

A number of additional publications in the Industrial Standards Series of the Bureau of Foreign and Domestic Commerce are now available. These contain standard specifications of the American Society for Testing Materials in English and Spanish, and include No. 14, carbon steel car and tender axles; No. 29, cast-iron locomotive cylinders; No. 45, iron and steel chain; No. 30, extra-high-carbon steel splice bars; No. 47, cast-iron car wheels; No. 35, structural steel for cars; No. 48, malleable iron castings. Copies may be obtained from the Superintendent of Documents, Washington, D. C., at 5 cents each.

Ambitious Japanese Electrification Project

Application has been made to the Japanese government, says an item in the Electric Railway Journal, for permission to construct a high-speed electric railway between Tokyo and Osaka, a distance of 287 miles. It is estimated that an expenditure of about $100,000,000 will be necessary for the purpose. The proposed line is about 69 miles shorter than the existing steam railroad. Doubt is expressed in Japan as to the willingness of the government to permit the construction of an electric line competing with its own steam line, but the promoters are counting on the changed commercial, financial and transportation conditions brought about by the war to cause the government to consider the project favorably.

Proposed Railway Extensions in Peru

A committee of civil engineers has been appointed to recommend to the Peruvian government the most feasible and desirable of the different surveys made for the construction of the Jatunhuasi Railway.

The Lima to Lurin railway, the construction of which was commenced under the administration of President Billinghurst, was completed and opened to traffic during the latter part of 1918. The road is 46 kilometers long.

The Peruvian Congress has authorized the executive power to build a branch railway from kilometer 76 on the Chimbote to Recuay line to Cajabamba.

Information has reached the State Department at Washington that the Peruvian Government has undertaken the construction of a railway line which will make possible transportation between the Pacific and Atlantic coasts across the widest part of South America. With the completion of the railroad goods can be shipped from Callao, on the Pacific, to ports on the Amazon River and transferred then to steamers bound for ports on the Atlantic. The new road starts at a point on the Cerro de Pasco Railroad, which runs from Lima to the Cerro de Pasco copper mines, which are owned by an American company. This firm was said to be interested in the construction of the new line, which will tap extensive virgin forests of valuable timber.

[Other references to new railway construction in Peru have appeared in this column in the issues of February 7, 1919, page 373; February 14, page 418; March 28, page 866 and April 18, page 1012. A map will be found in a more extensive article in the issue of March 7, 1919, page 533.]

American Railway Supply Prospects in Greece

Consul General Alexander W. Webber, at Athens, in a letter to the *Railway Age* makes the suggestion that American railway companies should appoint representatives in Athens to submit bids on government contracts; and submits a list of business men who might be willing to consider agency proposals.

With the exception of a few small suburban railways, he says, all railways in Greece are operated by the government ministry of transports.

"There are two facts which it is thought advisable to point out, in this connection, to American manufacturers of railway equipment," he continues. "The first is that the British and French Armies at Salonica, which are being returned home from the Macedonian front, are disposing of large quantities of material of all kinds at very favorable terms. It is possible that the Greek Government will avail itself of the opportunity to purchase railroad material. And secondly, it is understood here that the Canadian Government has offered to the Greek Government railway material and equipment, in great quantities, at very low prices.

"Present conditions, however, are not normal, and there is every reason to believe that American railway equipment manufacturers can advantageously meet ordinary European competition.

"While the firms named on the list below are of good local repute, no responsibility can be assumed for them by this office. They can doubtless furnish references, while detailed information relative to their financial strength and credit standing could no doubt be obtained, through any New York bank, from the National Bank of Greece, Bank of Athens, Commercial Bank, or any other financial institution of this city."

The commercial representatives whose names are given are J. M. Schapira, 21 Colocotroni street, Athens; George Rozis & Co., 50 Hippocrates street, Athens; Nicolaidis, Papazoglou, Politis & Co., Philonos street, Piraeus; Stephen C. Stephanson, 11 Lycourgou street, Athens; E. A. Hill, 55 Eolou street, Athens; Rousso & Danon, Piraeus; A. Denaxas

& Co., Stadium street, Athens; Christos Stassinopulos, 35 Miaouli avenue, Piraeus; Bernard Melissinos, Sophocles street, Athens; P. Vryonis, 1 Plouton street, Athens.

The South African Railway Budget

[Special Correspondence from Johannesburg]

The exhaustive statement of the Minister of Railways and Harbors on the railway estimates throws further light on the circumstances which have necessitated the recent increases of rates. For the current year (1918-19) the department was faced with the prospect of a deficit of £1,169,000. Rates were consequently increased as from May 11 and thereafter revenue showed a remarkable expansion until the influenza epidemic. The original estimate of general revenue was £276,034 per week. During the seven weeks preceding the epidemic the weekly earnings averaged £301,385. By the end of September, half way through the financial year, the total traffic receipts were £397,915 in excess of the estimates. There was, however, a big decline as soon as the effects of the epidemic made themselves felt. For the week ended October 26 the receipts dropped to £186,933, the lowest figure since Union, with the exception of the strike period and the week ended September 26, 1914, just after the outbreak of the war. It is calculated that the epidemic occasioned a loss in railway revenues of something like £550,000. It was not until December that signs of recovery became apparent, but for that and the following months the earlier record was re-established and exceeded the total ending February 8, being £342,000. Meanwhile the second increase in rates had taken effect from the New Year and as the combined result of the traffic improvement and the higher charges there is now every reason to hope that the ordinary railway revenue for the year will be approximately £650,000 in excess of the original estimate. To this position passengers, parcels, and general goods traffic have all contributed, the first named, so far from having shown any falling off owing to the increased fares, having attained proportions with which the department has been hard pressed to cope, while passenger traffic for the year constitutes a record since Union. There has also been a record tonnage of goods and minerals other than coal. Coal traffic, on the other hand, has decreased owing to the diversion of shipping and decline in military requirements, though the falling off in respect of bunkering has been set off by a heavy expansion in export and the internal coal traffic has generally increased. A noteworthy feature of the period under review has been that the heavy decline in the traffic in imports, brought about by war conditions and the restrictions on ocean transport, has been counter balanced by a contemporaneous increase in the revenue from internal sources. In this respect the railways have reflected the growing industrial activity within the Union which is a healthy sign of the times. From the standpoint of railway revenue the replacement of traffic in imported overseas goods by that in South African products is the exchange of a lucrative for a less productive class of business, but from the point of view of general development it implies that South Africa has been more favorably situated than most countries during the war. The gross revenue from railways is now expected to exceed the estimates by £805,055.

Expenditure

Turning to expenditure, the epidemic cost the department £77,000 in sick pay alone, while overtime and other sources of special outlay due to the same cause are estimated to have involved a further loss of £100,000. Apart from this exceptional visitation, however, there have been substantial causes of increased outlay, notably the war bonus, improvement in the pay of various sections of the staff and the increased cost of materials of all descriptions owing to the war. Under these circumstances the gross railway expenditure for 1918-19 is expected to exceed the estimates by £627,128 and the harbor expenditure by £67,525. The actual results of the year's working, however, are now expected to be considerably better than the original estimates implied and the net result has been a reduction of the estimated deficit on the current year, from £1,169,396 to £1,062,000. This deficit is being treated as estimated expenditure for the coming year.

Drawbacks of the Past Few Years

Glancing back over the conditions of the past few years, the Minister recalls a remarkable sequence of serious drawbacks, comprising the general strike of 1913, the railway strike and other industrial troubles in January, 1914; the outbreak of war; the rebellion in 1915; the prolonged drought of 1916; the destructive floods and washaways of 1917, and the devastating epidemic of last year. Throughout the whole of this period the general overseas position, and the state of affairs in regard to shipping, created constant difficulties. The cost of all requirements has been subject to constant expansion. The pay of men on active service absorbing nearly £1,250,000 per annum. The war bonus for railwaymen in the current year amounts to over £1,300,000. The rate of interest on capital has advanced. Despite all this, the Minister points out, and the improvements made in the pay and conditions of the staff, the expenditure has been met out of revenue, and the normal working of the railways has been maintained comparatively unimpaired. In this connection he pays a high tribute to the devotion of the Staff, and makes acknowledgment of the way in which unavoidable inconveniences have been borne by the public.

Financial Year 1919-20

For the financial year 1919-20 the estimated expenditures on railways and harbors is: Railways, £19,410,983; harbors, £913,087. Total, £20,324,070. There is an increase on railways as compared with the previous year, of £2,884,521 and on harbors of £79,498, a total of £2,964,019. The biggest contributory item towards this increase is the deficit of £1,062,000 from the current year.

The Estimate of Revenue

The estimate of revenue for 1919-20 leaves an anticipated deficit at the end of that period of £877,500. The question of how to deal with this position, the Minister states, has been the subject of the most careful consideration.

Funds can only be provided in two ways—by reducing expenditure or raising more revenue, and the only way of raising more revenue is by the increase of rates. It is not considered likely that the estimate of revenue will be exceeded under existing conditions. It is frankly recognized that the drastic expedient of withholding or reducing contributions to the renewals fund cannot be repeated, the fund stands at about £5,832,000, but the great bulk of this has already been ear-marked, and the Minister makes significant revelations as to the far-reaching extent of present requirements for getting the railways into proper working condition. Under these circumstances there is no alternative but to carry the deficit forward and await developments. If it seems likely that the deficit will be substantially covered, no action will be taken. If, on the other hand, there is no immediate prospect of wiping it out, it will be necessary to reconsider the whole position from the standpoint, presumably, of determining whether there will not have to be some further raising of rates.

J. E. Johanson, a member of the St. Louis (Mo.) Western District Freight Traffic Committee, has been appointed chairman of that committee to succeed C. E. Perkins who has resigned. G. E. Rambach has been appointed a member of the committee in place of Mr. Johanson.

Air Brake Association Holds Annual Convention

Record Attendance; Air Consumption of Auxiliaries and Holding Trains on Grades Among Topics Discussed

THE LARGEST DELEGATION of air brake men in the history of the organization gathered at the Hotel Sherman, Chicago, on Tuesday for the opening meeting of the twenty-sixth annual convention of the Air Brake Association. The first session was devoted to addresses by Frank McManamy, assistant director division of operation, United States Railroad Administration; W. J. Bierd, Federal manager, Chicago & Alton; W. J. Patterson, bureau of safety, Interstate Commerce Commission, and F. J. Barry, president of the association.

Address of President

President Barry in his address spoke of the past work of the association and mentioned its recognition by the Railroad Administration as showing the general recognition of the progress that had been achieved through the leadership of the organization. He urged that the association should continue its efforts to improve air brake service and to extend its sphere of activity, particularly by more active co-operation with the local air brake clubs, which offer an excellent opportunity for keeping in close touch with the problems arising in the maintenance and operation of air brakes. In closing he paid a glowing tribute to the genius of Walter V. Turner whose work was largely responsible for many of the most important recent advances in the art.

Address of Frank McManamy

Mr. McManamy emphasized the necessity for promoting safety, efficiency and economy in the operation of the railroads under present conditions and pointed out how the Air Brake Association can help to secure these aims. He spoke of the need for a realization of the fact that the air brake is not merely a safety device, but is essential for proper operation with the heavy motive power and long trains now in use. He mentioned also the part that could be taken in reducing damage claims by the proper maintenance of the air brake.

Mr. McManamy stated that in his opinion the neglect of brake equipment was too common on roads with low grades and that steps should be taken to remedy the condition. He recommended increasing the forces employed on air brake work and installing proper facilities at repair points where the equipment is overhauled. As the first essential for proper operation he suggested that more attention should be given to stopping leakage in the air brake system and especially in brake cylinders and retainer valves. He spoke also of the co-ordination of the mechanical associations under the American Railroad Association and the benefit that the Air Brake Association could derive by having its recommendation referred to the Mechanical Section and issued as mandatory instructions.

Address of W. J. Patterson

Mr. Patterson outlined the work of the Division of Safety as it affects air brake matters and spoke of the importance of improving general air brake conditions throughout the country. He advocated the universal use of the incoming brake test as a means of securing better conditions. He also referred to the fact that hand brakes are used to control freight trains when descending heavy grades and said that it was the intention of the Division of Safety to require such practices to be discontinued.

Air Consumption of Locomotive Auxiliary Devices*

The committee submitted a report of progress, giving a resumé of the work which had been done. The purpose of the committee's investigation was, (1) to investigate the rate of air consumption of auxiliary devices as found in service on locomotives; (2) to investigate the relation of air consumption by auxiliary devices to compressor operation; (3) to determine if the amount of air used is sufficient to warrant a separation of auxiliary devices from the air brake system, with a separate compressor to furnish air for them; (4) to determine if it is satisfactory to have the auxiliary devices take their air supply from the air brake system, but necessary on this account to install an additional compressor; (5) to investigate the cost of compressed air for operating the auxiliary devices used, and (6) to make recommendations with respect to the maintenance of auxiliary devices.

TESTS MADE AND RESULTS

While the data given here do not cover the subject completely, they will at least serve to give a conception as to what the use of air operated auxiliary devices on locomotives may mean in the ordinary practice of busy railroads. It is to be expected that this report will be regarded as a report of progress, and it is hoped that the work of the committee will be continued for the ensuing year.

The investigation covered in this report naturally divides itself into two parts, *viz.*, standing and running tests. The standing tests were made on locomotives in roundhouses, and consisted in measuring the amount of air used by the auxiliary devices operated while the locomotives were standing. The running tests were made on freight engines working over the road in service, and consisted of the continuous measurement of air used by the auxiliary devices in operation while the engine was running. The standing tests involved a total of 48 engines, and the running tests were made with six engines. A total of 489 individual tests were made, the results of which have been classified and arranged for the purposes of this report.

The locomotives used during these tests were not selected, nor were any locomotives inspected before the tests were made. It was desired to test the equipment just as it might happen to be available so that the data would be representative of average operating conditions. Furthermore, the standing tests were made at three division points and involved the equipment on four different divisions. The running tests were conducted on two road divisions.

Standing Tests—The standing tests involved measuring the amount of air used by the various auxiliary devices with the locomotive at rest. The form of apparatus for making this measurement is shown in Fig. 1. It consisted of two tanks connected as shown, the larger being designated as the measuring reservoir and the smaller as the pressure

*The meaning of the term "air operated auxiliary devices on locomotives," as used in this report, can be defined as referring to all air operated devices on locomotives which are not a part of the air brake system, such as air operated fire doors, bell ringers, reverse gears, sanders, etc.

reservoir. The measurement of the air used by each auxiliary device was accomplished in the following manner:

The auxiliary device to be tested was disconnected from the main reservoir on the locomotive and reconnected to the measuring apparatus at globe valve No. 3. A connection was likewise made from the main reservoir on the locomotive

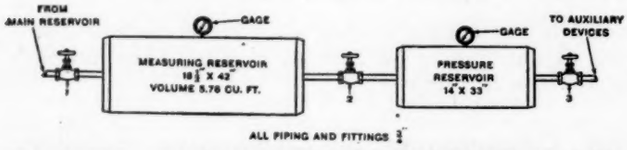


Fig. 1—Measuring Apparatus Used in Standing Tests of Air Operated Auxiliaries

to the measuring reservoir at globe valve No. 1. The air was measured by opening valve No. 3 and manipulating globe valves Nos. 1 and 2. The operator of valve No. 2 regulated that valve so that a constant pressure of 70 lb. was maintained in the pressure reservoir as the supply of air pressure to the auxiliary device under test. The operator of the main reservoir valve No. 1 opened this valve so as to charge the measuring reservoir up to the main reservoir pressure of the locomotive, usually 40 to 50 lb. higher than the constant pressure in the pressure reservoir. This operator

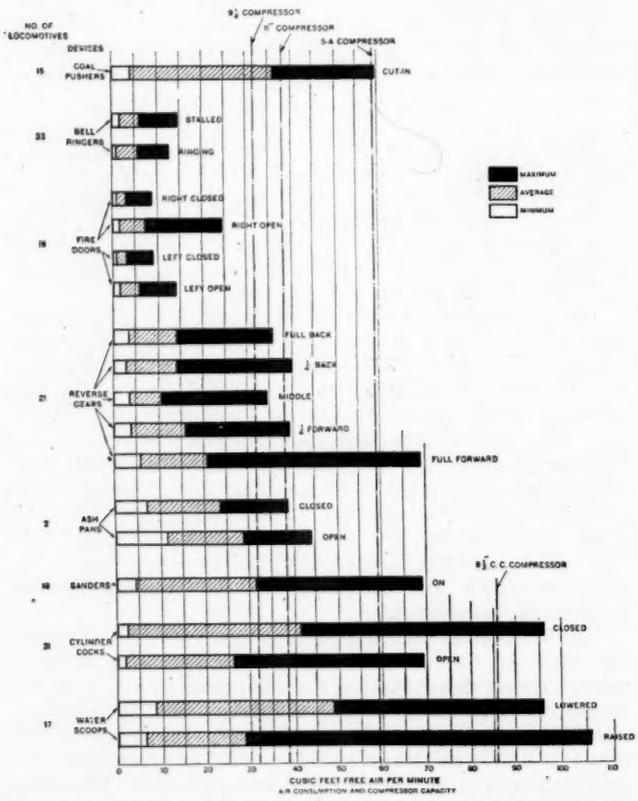


Fig. 2—Results of Standing Tests of Auxiliary Devices on All Locomotives

then closed valve No. 1 and noted the time required for the pressure in the measuring reservoir to drop any given amount during the time it was supplying air continuously to maintain the constant pressure in the pressure reservoir.

The air consumption was calculated as follows:

$$\frac{20 \text{ (drop in measuring reservoir)}}{14.7 \text{ (atmospheric pressure)}} = 1.36 \text{ drop in measuring reservoir expressed in atmospheres.}$$

1.36 atmospheres x 5.76 (volume of measuring reservoir) = 7.83 cu. ft. of free air supplied during the test.

$$\text{Then } \frac{7.83 \times 60 \text{ (No. of sec. in one min.)}}{78 \text{ (time of test in sec.)}} = 6.03 \text{ cu. ft.}$$

per minute.

The standing tests made on all auxiliary devices have been classified and arranged according to the type of locomotive upon which they were found, and the results are shown in graphic form in Fig. 2. Each figure on the chart shows the minimum, average and maximum rates of air consumption of all the auxiliary devices of the several types tested. The results for passenger locomotives are based on the standard passenger train reservoir pressure of 130 lb., although the actual tests were made at a constant pressure of 70 lb. In every case the data were converted from the 70 lb. basis to give the equivalent rate of air consumption at 130 lb. in the following manner:

$$\frac{\text{Rate of leakage, cu. ft. per min.}}{\text{Absolute test pressure (84.7 lb.)}} \times \text{Absolute press. on locomotive (144.7 lb.)}$$

equals rate of leakage on engine when main reservoir pressure is 130 lb. instead of 70 lb.; that is, the leakage is taken as proportional to the absolute pressures. The data for freight engines are based on 100 lb. main reservoir pressure, standard for freight service.

It will be noted that all charts have the capacity of air compressors indicated on them for convenient comparison with the rates of air consumption given. These values for compressor capacity are based on the rate of air delivery established by the Interstate Commerce Commission's compressor condemning tests, as shown in Table I.

TABLE I—COMPRESSOR CAPACITIES BASED ON I. C. C. CONDEMNING TESTS

Type of compressor	Delivery rate, cu. ft. free air per minute, 60 lb. pressure
9½-in.	32
11 -in.	37.5
5-A	59
8½-in. C.C.	86

Running Tests—Running tests were made with the object of determining the rate and total amount of air used by the auxiliary devices while the locomotive was working in regu-

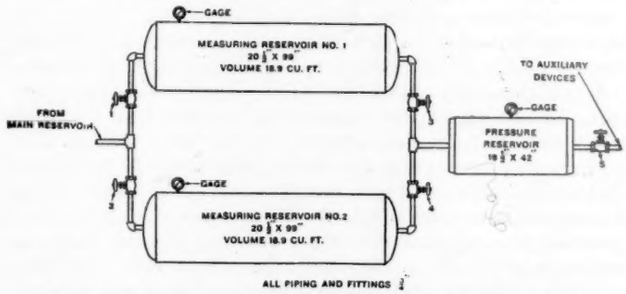

GAGE
MEASURING RESERVOIR NO. 1 20½ X 99" VOLUME 18.9 CU. FT.
TO AUXILIARY DEVICES
GAGE
FROM MAIN RESERVOIR
PRESSURE RESERVOIR 18½ X 42"
GAGE
MEASURING RESERVOIR NO.2 20½ X 99" VOLUME 18.9 CU. FT.
ALL PIPING AND FITTINGS ¾

Fig. 3—Measuring Apparatus Used in Running Tests

lar service. An apparatus was devised for measuring continuously the rate and amount of air used, and is shown diagramatically in Fig. 3. This apparatus is similar to that described above and shown in Fig. 1; the only difference being that two measuring reservoirs are used, with the object of permitting the measurement of air to go on continuously.

This apparatus was manipulated so that while the air was being measured by the dropping pressure in one reservoir, the other reservoir was allowed to charge from the main reservoir in order to be ready to start measuring the supply of air to the pressure reservoir as soon as the air pressure in the first measuring reservoir was exhausted.

The measuring apparatus was installed in a caboose which was run at the head end of the train next to the engine. The

piping was so arranged that with either end of the caboose toward the engine, connections could be made to the main reservoir and the auxiliary devices on the locomotive under test.

The length of running tests covered in this report varied from 3½ to 8 hours, or the time required to make a fast freight movement over a division of 131 miles. The running tests made were six in number and can be divided into two classes, *viz.:* (a) Running tests in which the rate of air consumption was measured for the reverse gear only, and (b) running tests in which the rate of air consumption was measured for all auxiliary devices.

Three tests of each kind were made, and each test was made during a full trip of an engine in regular service on

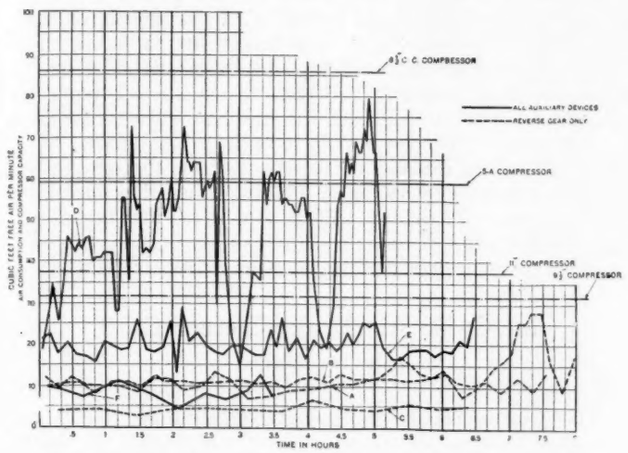


Fig. 4—Results of Freight Service Running Tests

fast freight. The running tests are, of course, of a great deal more importance than the standing tests, in that they show the rate of air consumption as it varies during the working time of the locomotive, and it is the judgment of the committee that more tests of this kind should be made.

The tests herewith presented do not provide sufficient data for basing definite conclusions, but they do show how the leakage of auxiliary devices will vary with running conditions on the road, and that cases do exist in which the air consumption is unreasonably high, if not actually dangerous, in the sense that it increases the possibility of an engine failure as the result of overworking the air compressor.

The running test, data are shown plotted in graphic form in Fig. 4. Each of the six tests is represented by a line which shows how the rate of air consumption varied throughout the trip. The three solid lines represent tests made on all auxiliary devices, and the three dotted lines represent the tests made in which the air consumption was measured for the reverse gear only. Additional lines are shown on the charts to indicate the capacity of different air compressors in order that comparisons between the compressor air capacity and the rate of air consumption can readily be made. All of the engines used in the six tests plotted on this chart were of the same class, and were equipped with two No. 5-A air compressors and the following air operated auxiliary devices: reverse gear, double fire doors, bell ringer, sander, water scoop, and cylinder cocks.

The tabulation below shows the total amount of free air used and the average rate of using during each of the six running tests shown in Fig. 4.

Locomotive designations	Auxiliary devices	Total cu. ft. free air used during trip	Cu. ft. free air used per min.
A	Rev. gear only.....	5,665.2	11.84
B	Rev. gear only.....	4,939.8	10.55
C	Rev. gear only.....	1,809.62	4.50
D	All devices.....	14,750	46.93
E	All devices.....	7,761.2	23.13
F	All devices.....	1,738.4	8.17

Cost Data—Fig. 5 has been made up from the running test data to show the relative cost of maintaining auxiliary devices at the minimum, maximum, and average conditions of leakage found during these tests. The first two figures of this chart show the minimum and average rates of air consumption for the three tests in which the reverse gear only was measured and the three tests in which all auxiliary devices were measured. These values were obtained from the test data by dividing the total amount of air used during the trip by the total time of the trip in minutes. The actual values used are shown in the last column of the preceding tabulation. The remaining figures in Fig. 5 give the relative minimum, maximum, and average cost for compressed air when using various types of air compressors. There are two figures for each type of compressor, one for the tests made with reverse gears only, and the other for the tests made with all auxiliary devices. These figures show the relative cost of supplying the compressed air required under the various conditions, based on the following assumptions: (1) That the average working time for locomotives is 6 hrs. per day, or 2190 hrs. per year; (2) That the rate of evaporation is 7 lb. of water per pound of coal; (3) That the price of coal on the tender is $2.00 per ton, or $1.00 per 1,000 lb.; (4) That the rate of steam consumption in pounds of steam used per 100 cu. ft. of free air compressed, is in accordance with

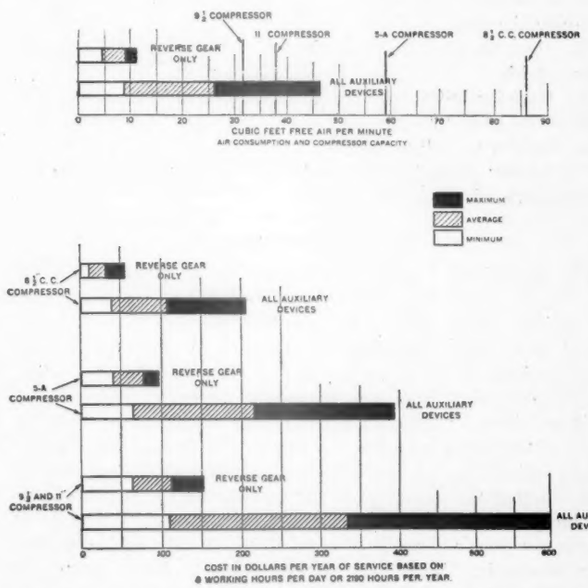


Fig. 5—Cost Data Based on Running Tests of Various Types of Air Compressors

the values given in Table II. These values have been determined from a series of steam consumption tests made on each of the types of air compressors indicated.

TABLE II—STEAM CONSUMPTION OF LOCOMOTIVE AIR COMPRESSORS

Type of compressor	Lb. of steam, at 200 lb. pressure, per 100 cu. ft. free air compressed: To 100 lb. main res. pressure	To 130 lb. main res. pressure
9½-in. and 11-in.....	68	76.25
5A.....	44.7	51
8½-in. C. C.....	24	25

The cost comparison figures are based upon the above assumptions only, no consideration being given to such factors as the cost of handling coal on engines, cost of water, depreciation of boiler plant and compressor plant, etc. These considerations have been omitted because the committee does not have sufficient data to accurately determine them. It is obvious that these factors would increase the costs shown, and

the chart figures can therefore be regarded as the minimum conservative values.

A detailed account of the results of the tests of individual appliances was given in the report. The theoretical or computed air consumption did not account for even the minimum consumption that was found during the standing test, proving that the greatest part of the air used was wasted through leakage due to improper maintenance of the devices. The committee believes that it would be worth while to continue the test with a view to establishing more complete data upon which performance standard and condemning tests could be made.

Conclusions

(1) Auxiliary devices under average conditions were found to use too much air.

(2) Conditions frequently exist where compressor capacity may be exceeded by the demands of the auxiliary devices.

(3) Some of the data justify the conclusion that auxiliary devices should be operated separately from the air brake system. On the other hand, some of the data show that with proper maintenance this conclusion might not be warranted.

(4) Under some of the conditions shown by these data, it would not be satisfactory to connect the auxiliary devices to the air brake system and increase the compressor capacity accordingly, unless the air brake main reservoir is protected from the consequences of excessive air requirement by the auxiliary devices.

(5) Cost basis data show that better maintenance would be profitable.

(6) Standards of performance, including maximum permissible leakage, should be established upon which to condemn devices unfit for service.

(7) Means should be devised for checking and testing the performance of auxiliary devices.

Recommendations

The committee recommended that its work be continued and this report be regarded only as a report of progress; that the data be made more complete by investigations on individual railroads, conducted as outlined in the report, such investigations to be reported to the chairman of this committee; that steps be taken to secure better maintenance of auxiliary devices; that further experiments be made with the object of devising satisfactory means for testing, and satisfactory standards of performance which can be applied to show whether the device is fit for service; and that consideration be given to the plan of operating the auxiliary devices at a pressure lower than that carried in the air brake system main reservoir. This plan would effect a large saving in air used, but would require a separate air supply reservoir with means provided for controlling the reduced pressure.

The report was signed by C. H. Weaver (N. Y. C.), chairman; C. B. Miles (Big Four), W. W. White (M. C.), and R. E. Miller (W. A. B. Co.).

Discussion

Great interest was shown in the results of the test and numerous opinions were advanced as to the cause of excessive leakage in auxiliaries and the method that should be used to overcome it. The practice of operating power reverse gears by steam when handling locomotives around the roundhouse was condemned by several speakers, who stated that steam destroyed the packing in the cylinders and caused excessive leakage. Some roads are now equipping metal disk power reverse systems with metal packing rings. T. F. Lyons (N. Y. C.) brought out the fact that leakage in the auxiliary devices might interfere with the proper operation of the brake even though it did not result in a large waste of air. The loss due to leaks in water scoop cylinders did not cause excessive air consumption because the cylinder is operated at infrequent intervals. However, in approaching water tanks the scoop is usually dropped at the same time as the brakes are released and excessive leakage in the water-scoop cylinder might seriously interfere with the recharging of the auxiliary reservoir.

Air Leakage Due to Defective Hose Couplings

A paper on Air Leakage and Money Wasted Through Failure to Keep Hose Couplings in Standard Gage, submitted by the Manhattan Air Brake Club, was presented at the Wednesday session of the convention. The paper emphasized the fuel waste due to brake pipe leakage and stated that examination of 1,600 freight cars showed that 35 per cent of the leakage existed in the hose couplings. Further investigation developed that it was difficult to find couplings in service that would pass the M. C. B. standard coupling gage test. Employees often use makeshifts to secure tight joints and at least one road has adopted a special gasket to eliminate hose coupling leakage. Some special types of gaskets submitted to railroads for approval when tested have required from 1,000 to 1,300 lb. to pull the hose apart. Such excessive strains fracture the hose and cause the brake pipe to shift, resulting in leakage. The paper recommended that the universal practice of gaging air brake hose couplings be included when periodic attention to air brake equipment is being given freight cars in shops or on repair tracks.

M. C. B. Air Brake Defect Card

By Jas. Elder

General Air Brake Inspector, Chicago, Milwaukee & St. Paul

The United States Railroad Administration, Fuel Conservation Division, in Circular No. 13, of August 31, 1918, issued by Eugene McAuliffe, manager, presents 15 specific recommendations made by an Air Brake Association committee. Recommendation No. 9 is as follows: "A rule should be put into effect that trainmen must apply an M. C. B. standard air brake defect card in cases where defects develop en route or for brakes cut out by them; defect to be checked off on back of card."

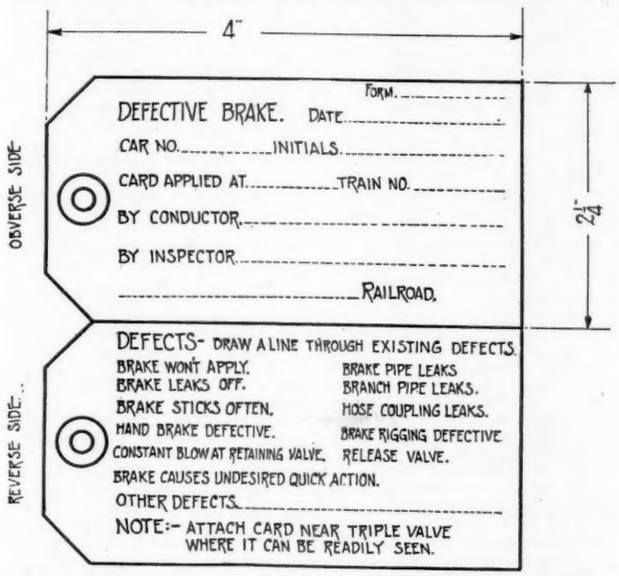
The M. C. B. card shows careful thought, but the changed conditions since its last revisions demand certain alterations to meet present requirements. Some believe the brake defect card has outlived its usefulness, basing this on (a) the great difficulty in getting it applied where needed; (b) on incoming brake tests rendering it less necessary; (c) and some object because of the appearance occasional trains would present if all cars with defective brakes were carded. Assuredly the brake defect card should either be used to better advantage or discontinued.

If a defect card is yet needed and is practicable after having simplified the card, it will be very desirable to have mandatory instructions as to responsibility for its application. As this car is a detail of repairing, for which car men are responsible, *car men should be primarily responsible for its application;* that is, before a departing train is released from the blue signals, the inspectors should have either repaired or carded every defective brake. With this insured, it would be fair to insist that the departing train crew should card every defective brake delivered at the next terminal. However, as the incoming test should invariably be made, and as this would disclose to inspectors all defects except with cut-out brakes, it is submitted that if train men are required merely to card properly every brake brought in cut-out, all needs will be met, and the work of getting cards used by them will be lessened in a rational manner.

If one road cards all defective brakes not repaired and a connecting line does not, the former will be subjected to an unfair comparison; hence, that if real value is to be obtained from the defect card, its full and similar use must be obligatory on all roads in interchange traffic. If the defect card

is to be continued the following additional means for bettering the results obtained should be adopted. The card and its use should be simplified, and then action looking toward its obligatory and uniform use by all railways in interchange service should be taken. The stub should be omitted. If it were possible to get the stubs filled out and forwarded, they would merely burden the mails and the offices. The reasons warranting omission of the stub also justify dropping from the card all matter pertaining to its use after the defect has been repaired. The size proposed is 4 in. by 2¼ in.

With all-air trains, a defect which prevents placing a certain car between other air brake cars, puts it back of the caboose. This advertises the defect on arrival at the next terminal, and as it must not go farther until repaired, there is now no use for the second card, as there was when the present M. C. B. card was designed. Where an existing defect does not require air pressure to locate it, such as one



Suggested Revision of M. C. B. Air Brake Defect Card

with either the hand brake or the foundation brake, it is plainly undesirable to elaborate the card by specifying the various points where such defects commonly develop. The revised card submitted is here illustrated.

Discussion

Practically all who discussed the paper agreed that the defect card gave valuable information, but that considerable difficulty was found in getting train men to use them. There was a marked difference of opinion regarding the advisability of eliminating the stubs. The association adopted a motion recommending the adoption of the air brake defect card revised as suggested in the paper, the use of this card to be confined to train men and inspectors in departure yards.

Holding Standing Freight Trains and Cars on Grades

By R. J. Watters
Assistant Air Brake Inspector, Northern Pacific

While many, if not most roads with steep grades have recognized the possible great dangers incident to holding standing trains and cars on grades, and have generally issued rules or instructions to guard against such dangers, yet the fact that even on such roads there is a strong tendency, on the part of some officials as well as of the men in the train service, to gravitate toward easier and more dangerous practices, and the further fact that many accidents from lack of the right practices occur on roads with grades too light to include them under the term mountain or steep grade roads, amply justify the Air Brake Association's careful consideration of this subject.

As before implied, probably the greater danger is due to laxness in the daily enforcement of rules and instructions on this subject. Observance of these requires more forethought and co-operation on the part of engine and trainmen to reduce the time and labor for compliance; and even then the latter will be greater than by the easier but more dangerous ways. Familiarity with steep grades, and the many deviations from safe practices that can occur so generally without an accident following, tend constantly toward habits which, unless checked regularly, will eventually result in disaster. One of the most common and dangerous of these is failure to release and recharge the train brakes promptly after stopping on a grade, which should invariably be done whether or not the engine in control is to be cut off.

A general superintendent of a large road with several long and steep grades, expressed this matter well by the statement that it was necessary about every six months to instruct each superintendent having a steep grade, to report how well safety precautions against runaways were being observed, but not to do so until he had the trainmaster and the traveling engineer make a special investigation and report. He said that without this, a serious accident invariably occurred in time, and that its investigation disclosed chronic laxness as the cause.

The following definite instructions and recommendations are submitted on the subject of this paper:

As soon as a train is stopped on a grade, brakes should be released and recharged at once. If the engine from which brakes are being operated remains attached, and keeps the train charged, as it then should, it may be held with the independent brakes; that is, by keeping the independent or the straight air brake valve in application position. An exception is where the engineer is to leave the engine. In this case enough hand brakes to alone hold the train should be applied. This should be proved by having all automatic and independent brakes off and, if the compressor may be kept running, then the independent brake should be reapplied and its brake valve handle left in application position.

If the engine from which the train brakes are being operated is to be cut off, enough hand brakes to alone hold the train, should be applied, but the trainmen should not commence to apply them until the automatic brakes are released. Where retaining valves are in use, none need be turned down, but no hand brakes should be applied until one minute after train brake release is begun.

Hand brakes used to hold cars or a train on a grade should be applied at the down-grade or lower end, thereby assuring against any car starting if uncoupled. All slack should be in, against the applied hand brakes, as well as all automatic brakes off (see previous exception about retaining valves) before cutting off an engine.

If, with the engine in control of the train cut off, another engine is to be detached, as a helper or pusher, its engineer should first cut in, release and recharge the train brakes, then release the independent brake so as to be certain the train will stand after the engine is cut off. While remaining with the train the independent brake should be kept applied on each of any such other engines.

With a descending train, the final reduction to bunch the slack, as the stop is being completed, should be followed, during the wait of one minute after release is begun before commencing to apply hand brakes (at the head end), by reversing and pushing the slack in as much more as possible, then holding the train with the independent brake while the hand brakes are being applied.

With an ascending train, that the slack is in before cutting off should be insured by allowing it to drop back gradually, with train brakes off, until the train will stand with no aid from the engine in control. It should be held by hand brakes applied at the rear, aided by the independent brake of each other engine in the train.

If a break-in-two, or burst hose occurs on a grade immediately apply more than enough hand brakes to alone hold the train until its brakes are again recharged. If it is a descending train, and a coupling is damaged that will take some time to repair, and if the portion of the train with the engine (ahead) can be backed so as to couple the detached hose, it should be done and the train kept recharged during any necessary wait while obtaining a repair part, as a knuckle or pin, or if a delay must ensue before putting the damaged car elsewhere, as where this occurs where the car may be switched out or to the rear end.

It should be noted that the air brakes are off before applying hand brakes on cars set out on a grade, and on level track as well, sufficient to hold them. It is not necessary to bleed the air from auxiliary reservoirs of cars so set out as long as the air brakes are off when the hand brakes are applied. In addition to the foregoing any rules regarding blocking cars should be complied with. Hand brakes applied when the car air brakes are set, may result in broken chains when the air brakes leak off, especially dangerous with one or two cars. Even where this exceptional failure does not occur, they will often be so difficult to release as to necessitate the delay and waste of air required to apply the air brakes to aid in releasing them.

Instructions on Freight Car Brake Maintenance

A paper giving detailed instructions for the maintenance of freight brake equipment was presented by Mark Purcell (Northern Pacific). The need for clear and definite instructions in printed form was shown by the tests of cars shortly after cleaning, which demonstrated that 21.3 per cent of the brakes cleaned were ineffective within one month. Two years of special inspection and instruction work reduced the percentage to 8.8 which still left a big opportunity for improvement. The need for detailed instruction is particularly urgent at the present time because of the large number of inexperienced men in the air brake department.

To avoid unnecessary switching and loss of car service, work should be done well when the cars are sent to the repair track and every opportunity taken to ascertain the condition of the brakes when on the repair track, house track and transfer track. The installation of air lines at such points was advocated as a means of reducing the cost of brake maintenance, increasing car efficiency and expediting train movement.

This completes the report of the proceedings up to the time of going to press. The remainder will appear in next week's issue.

Exhibitors at the Air Brake Convention

An organization of manufacturers of air brake and accessories, for supervising the exhibits in connection with conventions of air brake associations, was formed at a meeting held in the Hotel Sherman, Chicago, May 7. At this meeting a constitution and by-laws were adopted and the name, Air Brake Appliance Association, chosen. The following officers were elected: Chairman, J. J. Cizek, The Leslie Company; secretary-treasurer, F. W. Venton, Crane Company. Members of the executive committee for three years: J. F. Gettrust, Ashton Valve Company; J. C. Younglove, H. W. Johns-Manville Company; J. D. Wright, Westinghouse Air Brake Company. Members of the committee for two years: F. W. Venton, Crane Company; J. H. Dennis, New York & New Jersey Lubricant Company; L. H. Snyder, Joseph Dixon Crucible Company. Members of the executive committee for one year: J. J. Cizek, The Leslie Company; M. S. Brewster, U. S. Metallic Packing Company; D. S. Prosser, U. S. Rubber Company.

The companies exhibiting devices at the Air Brake Association convention this year, together with a list of their representatives, are given below:

Anchor Packing Company, Chicago.—Packing. Represented by John Landreth.

Ashton Valve Company, Boston, Mass.—Gages, gage testers and safety valves, portable boiler test pump, inspectors' testing and proving outfit. Represented by J. W. Motherwell and J. F. Gettrust.

Barco Manufacturing Company, Chicago, Ill.—Metallic engine-tender air, steam and water connections, air reservoir joint connections, metallic car steam heat connections, smoke box blower fitting. Represented by F. N. Bard and C. L. Mellor.

Broschart Threadless Pipe Coupling Company, Trenton, Mo.—Emergency train-line repair coupling.

Chicago Railway Equipment Company, Chicago, Ill.—Brake beam supports. Represented by E. G. Busse and E. A. LeBeau.

Detroit Lubricator Company, Detroit, Mich.—Lubricators and flange oiler. Represented by A. G. Machesney.

Dixon Crucible Company, Joseph, Jersey City, N. J.—Graphite and graphite products for railroad service. Represented by L. H. Snyder and F. R. Brandon.

Edna Brass Manufacturig Company, Cincinnati, Ohio.—Lubricators, injectors and boiler checks. Represented by E. O. Corey and H. A. Glenn.

Garlock Packing Company, Palmyra, N. Y.—Air brake gaskets, air pump throttle, cab cock and reverse gear packing and spiral packing. Represented by W. G. Cook.

Gould Coupler Company, New York City.—Gould universal automatic brake slack adjuster. Represented by William H. Sauvage, W. F. Richards, George R. Berger and William Garstang.

Johns-Manville Company, H. W., New York.—Air pump, throttle and brake cylinder packing, expander rings and slack adjuster. Represented by J. E. Meek, C. E. Murphy, Fred Horne, G. Christenson, L. S. Wilbur, J. C. Younglove, D. L. Jennings, P. C. Jacobs, E. H. Willard and P. R. Austin.

Leslie Company, The, Lyndhurst, N. J.—Steam heat regulators and removable injector coupling nuts. Represented by S. I. Leslie and J. J. Cizek.

Nathan Manufacturing Company, New York.—Injectors, lubricators, boiler check, gage cocks, non-lifting coal sprinkler. Represented by Otto Best, W. E. Brumble, J. G. Arn and Richard Welch.

New York & New Jersey Lubricant Company, New York.—Non-fluid-oil brake cylinder lubricant and N. F. O. triple valve lubricant. Represented by J. H. Bennis and F. J. Barnes.

New York Belting & Packing Company, New York.—Air brake and air signal hose, air tool hose, car heating and tender hose, gaskets, air coupling, packing rings, rubber gaskets, air pump packing, rubber belting, etc. Represented by L. F. Purtill.

Ohio Injector Company, Chicago, Ill.—U. S. Standard injector, Chicago non-lifting injector, Ohio injector, Chicago lubricator, Chicago flange oiler, Chicago automatic drifting valve, Ohio water glass protector, Ohio boiler checks and Ohio feed hose strainer. Represented by A. C. Beckwith.

Simmons-Boardman Publishing Company, New York—*Railway Age* and Railway Mechanical Engineer. Represented by A. F. Stuebling and J. M. Rutherford.

Traction Lubricating Company, Chicago, Ill.—Air brake lubricant. Represented by D. W. Kimball.

U. S. Metallic Packing Company, Philadelphia, Pa.—King type air pump packing. Represented by M. B. Brewster and H. E. Hyslop.

United States Rubber Company, New York.—Mechanical Goods Division. Air brake hose, pneumatic tool hose, gaskets and packings. Represented by C. S. Prosser.

Westinghouse Air Brake Company, Pittsburgh, Pa.—M. C. B. hose coupling gages and hose coupling gasket gages, individual car testing device, air brake cleaning and testing tools and devices, triple valve test rack, brake pipe vent valve, automatic brake valve with collapsible equalizing piston, M. C. B. standard hose coupling packing ring gage, shipping caps for triple valves, auxiliary devices governor. Represented by J. B. Wright, F. H. Parke, A. L. Berghane, G. B. Pierce, F. M. Nellis, E. H. Dewson, H. H. Burns, F. B. Johnson, J. S. Y. Fralich, E. Weaver, B. F. Key, G. A. Stenson, A. G. Houston, R. E. Miller, W. M. Sleeth, C. J. Ohmstead, L. M. Carlton, L. Wilcox, C. H. Larimer, E. W. Davis, F. W. Nagle, T. L. Burton, A. B. Brown, C. E. Rowley, H. L. Cusic, G. W. Wildon, C. C. Farmer, F. B. Farmer, H. A. Wahlert, C. D. Foltz, V. Villette, J. D. Siegrist.

The director general had received up to May 3 the following reports regarding the progress of the Victory Loan among employees of federal operated railroads:

Region	Employees on roll	Employees subscribing	Amount of subscriptions	Per cent of employees subscribing
Northwestern	251,599	164,270	$16,160,150	65.29
Southern	235,263	69,587	6,307,000	26.14
Southwestern	177,321	84,786	8,435,800	47.8
Pocahontas	51,334	15,986	1,499,150	31.14
Central Western	305,057	180,800	16,708,900	59.3
Allegheny	382,434	184,999	14,878,100	48.37
Eastern	420,473	213,822	19,702,050	50
Pullman Lines	21,061	13,385	1,070,500	64
N. Y. N. J. Canal	34	28	3,850	82
Coastwise S. S.	.....	1,604	107,400	..
Total			$85,872,900	

General News Department

William Howard Taft, speaking before the Hamilton Club, at Chicago, on Wednesday last, called on the Republican party to make a party issue of the return of the railroads to private ownership.

The Michigan East & West Railroad, which is now operated under a court injunction restraining its owners from dismantling the road, evidently will have to go before the Michigan State Railroad Commission to get leave to expire. The road was sold under foreclosure. Officers of the state, understanding it to have been sold as a "going concern" exercised their authority to prevent the buyer from taking up the rails. The line of road is 72 miles long from Manistee, eastward to Marion.

Governor Lowden, of Illinois, this week sent a message to the Legislature asking for the appointment of a joint committee to investigate charges that representatives of the Pullman Company had approached members of the state board of equalization on matters relating to assessments of the Pullman Company's property. M. H. Malone, president of the board of equalization had declared that members had been threatened with the loss of their positions if the Pullman Company's assessment should be increased. Resolutions in accordance with the governor's wish were passed by both Senate and House. Governor Lowden, formerly a director of the Pullman Company, resigned his directorship when elected governor.

Western Railway Club

The annual meeting of this club will be held on May 19 at the Hotel Sherman, Chicago. The usual dinner preceding the meeting will be served in the Italian Room at 6:30. The meeting will be held in the Louis XVI Room at eight and there will be an address by R. A. White on international problems.

Accounting Officers' Association

The Railway Accounting Officers' Association will hold its 31st annual meeting at the Commodore Hotel, New York City, on Wednesday, June 11. C. A. Prouty, director of the division of accounting, United States Railroad Administration, is expected to be present. Members should make their hotel reservations as far in advance as possible; $2.50 to $4 for single room with bath, and $4 to $6 per day for double rooms with bath.

American Society for Testing Materials Convention

The American Society for Testing Materials will hold its twenty-second annual meeting at the Hotel Traymore, Atlantic City, N. J., on June 24, 25, 26 and 27. Among the features of special interest to railway men as outlined in the tentative program are a session on preservative coatings, lubricants and containers on Tuesday afternoon; a session on steel and wrought iron on Wednesday forenoon; one on Wednesday evening on corrosion and magnetic analysis, and one on concrete and gypsum, including the report of the committee on reinforced concrete, on Friday afternoon. The convention will close with a joint session on cement and concrete with the American Concrete Institute on Friday evening.

Pacific Railway Club

At the annual meeting of the Pacific Railway Club, held at San Francisco, Cal., on March 13, the following officers were elected: president, C. E. Norton, chief despatcher of the Southern Pacific; first vice-president, Dennistoun Wood, assistant mechanical engineer, Southern Pacific; second vice-president, George H. Harris, general superintendent, San Francisco-Oakland Terminal Company, and treasurer, G. H. Baker, Atchison, Topeka & Santa Fe.

O. S. Corbin, engineman on the Southern Pacific, addressed the meeting on the subject of "The Prevention of Accidents at Highway Grade Crossings," treating the matter from the standpoint of the engineman. Eugene H. Baker and Mr. Dembow also spoke on the same subject. Following a discussion on this subject the meeting was addressed by Chaplain John T. Kendall of the 44th Infantry.

Reception for the Thirteenth Engineers

Arrangements have been completed for the reception at Chicago next week of the 13th (Railway) Engineers. This regiment was recruited in Chicago immediately after declaration of war from the Chicago Great Western, the Chicago, Milwaukee & St. Paul, the Chicago & North Western, the Chicago, Rock Island & Pacific, the Illinois Central and the Atchison, Topeka & Santa Fe. The regiment is expected to arrive in Chicago on Monday morning, May 11. Breakfast will be served the men at the Coliseum. At 11 o'clock they will parade through the loop district and then will have luncheon at one of the large hotels. At four o'clock in the afternoon the regiment is scheduled to leave for Camp Grant, Rockford, Ill., for demobilization. In the reviewing party will be the federal managers of the six roads having companies in the regiment and Major General Leonard Wood. Arrangements have been completed for giving railroad employees, so far as possible, a holiday in order to welcome the soldiers.

Railroad Employees' Subscriptions for Victory Bonds

The director general has received up to May 7 the following reports regarding the progress of the Victory Loan among the men and women employed by the United States Railroad Administration:

Region	Employees on roll	Employees subscribing	Amount subscriptions	Per cent of employees subscribing
Northwestern	248,588	180,013	$17,664,900	72.41
Southern	264,796	89,804	8,337,000	33.91
Southwestern	177,326	96,464	9,775,900	54.4
Pocahontas	51,334	20,489	1,910,000	39.91
Central Western	307,699	197,676	18,899,250	64.2
Allegheny	382,780	214,894	17,431,500	56.14
Eastern	427,909	251,535	23,096,650	58.
Mississippi-Warrior (water lines)	.....	.....	9,600	...
Pullman Lines	21,061	16,355	1,308,450	78.
N. Y. Canals	34	33	4,850	98.
Coastwise S. S.	.....	1,918	126,850	...
Central Adm'n.	1,242	1,242	500,050	100.
Total	.....	.....	$99,065,000	....

Luncheon to Thornton and McCrea

Ralph Peters, president of the Long Island Railroad, New York city, on Wednesday of this week gave an informal luncheon in honor of Major General Sir Henry W. Thornton and Colonel J. A. McCrea, both lately returned from France. The list of guests included the following: William A. Nash, chairman of the board of directors of the Corn Exchange Bank; Walter E. Frew, president of the Corn Exchange Bank; George A. Gaston, of Gaston, Williams & Wigmore; Lewis L. Clarke, president of the American Exchange National Bank; Austin B. Fletcher; Colonel George T. Slade; John Markle; Colonel A. L. Whiting, 13th Engineers; Thomas DeWitt Cuyler, chairman of the board of directors of the Pennsylvania Railroad; Samuel Rea president Henry Tatnall vice-president and A. J. County vice-president, Pennsylvania Railroad; F. D. Underwood, president, Erie Railroad; W. H. Truesdale, president, Delaware, Lackawanna & Western; L. F. Loree, president, Delaware & Hudson Company; Howard Elliott, president, Northern Pacific; W. G. Besler, president, Central of New Jersey; H. F. Gunison, publisher of the Brooklyn Daily Eagle; W. A. Goodman, Jr.; A. R. Parsons, of Douglas L. Elliman & Co. and Lieut. Ralph Peters, Jr.

May Day in Denver

Approximately 6,000 railroad shop employees held a mass meeting in Denver, Colorado, on May 1, and adopted resolutions protesting against the efforts of "certain moneyed interests to force private ownership" and favoring a nationwide strike in the event of their success. Resolutions were also passed disapproving of the imprisonment of Eugene V. Debs and extending cordial greetings to "our Russian fellow workers and wishing them Godspeed in their successful venture and epoch making revolution." Other resolutions adopted called for the immediate withdrawal of American troops from Russia, censured the "undemocratic methods being used by our national officers in connection with the new wage schedule," and protested against unemployment among railroad men.

The meeting was attended by employees of the shops of the Denver & Rio Grande, the Colorado & Southern, the Union Pacific, the Chicago, Burlington & Quincy and the Denver & Salt Lake. All of the shops of these roads were closed for the afternoon. A committee in each shop asked the foreman for a half holiday for the May day celebration and the holiday was granted in each case. The shop workers contended that the government had failed to make a satisfactory agreement with them, and declared that, in violation of its pledge to keep all railway shop hands working, 60 per cent of the employees in one shop had been laid off. Inquiries were made if the present Victory loan is to be used to wage war on Russia. The resolutions as adopted were ordered printed and distributed broadcast over the country.

Record of the Engineer Corps

A resume of the work of the Engineer Corps of the American Expeditionary Forces has been issued by the office of the chief engineer of the A. E. F. and is included in Engineering Recruiting Circular No. 2 used by army recruiting officers in their campaign for volunteers. The circular states that there were 174,000 engineer troops in the service. Part of the work done by the railway engineering units in this force consisted of the construction of 947 miles of standard gage track and a six mile cut-off at Nevers requiring a bridge across the Loire river, 2,190 ft. long. This latter project had been described in the *Railway Age*.

Among the accomplishments of this force are listed many records in the construction and operation of military railroads. The light railways of the American Expeditionary Forces handled to February 1, 860,652 tons of freight, of which 166,202 tons was ammunition. In one week the ammunition moved amounted to 10,600 tons, and in five nights 23,135 soldiers were carried on these railways. The daily net tonnage handled in October, 1918, was 8,100 tons. In one week 10,700 tons of rations were handled. At the time of the signing of the armistice 2,240 kilometers (1,392 miles) of light railway were in operation, of which 1,740 kilometers had been taken from the Germans, the balance being newly constructed or rebuilt. On November 11, 165 locomotives and 1,695 cars were available for use. In five hours 135 men laid 14,200 ft. of light railway track. Among the shops erected were 10 buildings at Abainville, with a total floor area of 70,000 sq. ft. Over 2,300 cars have been erected and 140 locomotives have been repaired in these shops.

In a letter to Major General William C. Langfitt, chief engineer, General John J. Pershing, expressing his appreciation of the work of the engineer department, said:

"The various units attached to combat troops distinguished themselves at all times in the assistance which they rendered. The Division of Construction and Forestry, with limited resources at its disposal and under conditions of extreme severity, more than met the many demands made upon it. The Department of Light Railways and Roads furnished the indispensable link between the railheads and the front lines for the transportation of troops and supplies, and for the evacuation of sick and wounded. Its record in the construction and operation of light railways and roads has seldom been equalled. The many other services of the Engineer Department, connected with the acquisition and distribution of engineer supplies, particularly those needed for combat operations, were so conducted that our forces never lacked for any essential.

"The Engineer Department has made a proud record for itself, and it gives me pleasure to express to you my sincere thanks and admiration, and that of your comrades of the American Expeditionary Forces, for its splendid achievements."

Fuel Association Convention

Following is the program for the annual convention of the International Railway Fuel Association, which will be held at the Hotel Sherman, Chicago, May 19-22:

MONDAY, MAY 19

Address by the president, L. R. Pyle, supervisor of fuel conservation, Central Western region, Railroad Administration.
Report of Committee on Pulverized Fuel, chairman, W. J. Bohan, assistant mechanical superintendent, Northern Pacific.
Teamwork of Engineers and Firemen, by M. A. Daly, fuel supervisor, Northern Pacific.
Locomotive Fuel Losses at Terminals, by J. M. Nicholson, fuel supervisor, Atchison, Topeka & Santa Fe.

TUESDAY, MAY 20

Responsibility of a General Operating Officer and What He Can Do to Promote Fuel Economy, by F. H. Hammill, general superintendent, Union Pacific.
Storage of Coal by Railroads During 1918, by Professor H. H. Stoek, professor railway engineering, University of Illinois.
Fuel Losses Due to Distorted Valve Gears, by J. W. Hardy, supervisor, Fuel Conservation Section, Railroad Administration.
Dirt in Coal, by L. J. Joffray, general fuel inspector, Illinois Central.
Tests of Locomotives on Russian Railways, by I. B. Lebedeff, assistant chief of locomotive department, Russian Mission of Ways of Communication.
Burning Oil on Locomotives, by William L. Hack, district road foreman of engines, Southern Pacific.
Equated Tonnage, by R. N. Begien, general manager, Baltimore & Ohio Western Lines.

WEDNESDAY, MAY 21

Address by Frank McManamy, assistant director, mechanical department, Division of Operation, Railroad Administration.
Certain Essentials, by Eugene McAuliffe, manager, Fuel Conservation Section, U. S. Railroad Administration.
Fuel Department Organization, by T. Duff Smith, fuel agent, Grand Trunk.
Co-operative Research and the Railway Fuel Problem, by Captain O. S. Beyer, Jr.
Internal Combustion vs. Steam Engines for Small Stationary Plants, by C. A. Lichty, secretary-treasurer, American Railway Bridge & Building Association.

THURSDAY, MAY 22

Report of Standing Committee on Front Ends, Grates and Ashpans, chairman, H. B. MacFarland, engineer of tests, Atchison, Topeka & Santa Fe.
Results of Tests Showing Losses Due to Front End Air Leaks, by E. P. Roesch, supervisor, Fuel Conservation Section, Northwestern region, Railroad Administration.
Reports of standing and special committees.
Election of officers.

New York Railroad Club

The meeting of the New York Railroad Club on Friday evening, May 16, will be different from anything that has heretofore been attempted by that club. There is a considerable number of foreign railroad officers in this country, a number of them associated with purchasing commissions. Several of these gentlemen will make brief addresses explaining something of railroad conditions in their own countries.

Association of Railway Chief Surgeons

This association held its annual meeting at the Hotel Commodore, New York city, on Monday and Tuesday of this week. Dr. C. W. Hopkins (C. & N. W.) was elected president for the ensuing year; Dr. Duncan Evans (N. C. & St. L.), vice-president; Dr. L. J. Mitchell, 29 East Madison street, Chicago, treasurer.

B. R. T. Convention

The Brotherhood of Railroad Trainmen will hold its triennial convention at Columbus, Ohio, beginning on May 14. The convention is expected to last at least a month and it is planned to give consideration to the reconstruction work among members who have returned from active service with the army or navy. Director General Walker D. Hines will address the convention but the date of his appearance has not been announced.

Traffic News

An attractive booklet, setting forth the advantages of the state of North Carolina to the homeseeker, has been issued by the Agricultural Section of the United States Railway Administration. It contains full information about production of all kinds, transportation, markets, roads and climate. The statistical information was furnished by the commissioner of agriculture for North Carolina.

For soldiers and sailors attending the first convention of World's War Veterans, which will be held at St. Louis, Mo., on May 8, the Railroad Administration has announced a general fare of two cents a mile, with a minimum charge of $2 for the round trip. For the Grand Army of the Republic a fare and one-third for the round trip has been made from stations on the Texas & Pacific and the Southern Pacific to Houston, Tex., for the encampment and meetings of allied societies held at Houston, on May 8, 9 and 10.

Export Traffic

The weekly report for the week ended April 30, shows at North Atlantic ports a total of 31,567 carloads of export freight on hand, compared with 32,566 cars the preceding week (exclusive of bulk grain and coal). On the same date there were 7,469 cars of export food on hand, compared with 8,206 cars for the week previous. There were 18,893,111 bushels of grain in elevators at North Atlantic ports, 7,952,878 being received during the week while 8,356,278 bushels were cleared. At South Atlantic and Gulf ports there were 2,922,144 bushels of grain on hand for the period mentioned.

Transcontinental Rates on Oriental Goods

Director General Hines has announced reductions in freight rates from Pacific coast ports to all eastern territory on a large number of commodities which are imported from the Orient. Some of the commodities and the proposed rates thereon are shown below. The effective dates of these new rates cannot yet be announced, but they will be published at the earliest practicable date on three days' notice. Most of the rates are reductions of from 10 to 25 per cent.

New Import Rates

	C. L. Per 100 lb.	L. C. L. Per 100 lb.
Eggs, dried, etc.	$2.00	....
Bagging burlap, etc.	.75	....
Beans, cocoa	.85	....
Chinaware, crockery, etc.	1.50	$2.00
Hemp, jute, sisal, etc.	.75	....
Hides, green	1.10	....
Matting and rugs	1.50	2.00
Rattan, cut to length	1.20	....
Rubber, crude	1.00	2.25
Tallow (inedible)	.85	....
Tea and tea dust	1.50	2.50
Tin, bar, block, etc.	.75	....
Toys	2.00	3.00
Bulbs, plants, etc.	1.50	2.00
Cotton piece goods	....	2.00
Dry goods, N. O. S.	....	3.12½
Fibre, ramie	1.25	....
Fans, palm leaf or paper	....	2.50
Fans, N. O. S.	....	3.25
Oranges	1.44	....
Paper or fibre articles	....	2.50
Rugs, hemp or cloth	1.50	2.00
Spices, etc.	1.25	2.00
Wool in grease	....	1.25
Silk waste	....	2.50

The Trans-Canada Express

The Canadian Pacific is to run a regular train through from Montreal to Vancouver in 93 hours, 30 minutes. The new train is to begin running on June 1 and is to be called the Trans-Canada, and it will be in addition to the two regular through trains now in service. The announcement in Montreal papers calls attention to the fact that the best time across the continent in the United States is 98 hours, 50 minutes; but no mention is made of the fact that the distance by the American roads is considerably greater. From Montreal to Vancouver the distance is 2,886 miles, making the rate of speed of the new train about 31 miles an hour; whereas from New York to San Francisco by way of the New York Central, the Chicago & North Western, the Union Pacific and the Southern Pacific, the distance is 3,225 miles, or 339 miles more than the length of the Canadian Pacific route; and the time from New York to San Francisco, 98 hours, 50 minutes, makes the rate of speed 32.63 miles an hour.

Advance in Passenger Fares in Michigan

By a law which has been passed by the legislature of Michigan and which goes into effect on August 14, next, all railroads and interurban roads in that state having gross annual earnings of less than $8,000 a mile, may increase their passenger fares to the basis of 2½ cents a mile. Roads earning $8,000 or more must continue to carry passengers at 2 cents a mile.

Vicissitudes of the Express Business

According to the New York Sun all parties holding claims against the Adams Express Company for goods lost prior to July 1, 1918, will be paid 60 cents on the dollar without question. Announcement to that effect has been made by C. W. Stockton, counsel for the company. The offer is for claims in cases in which the company received the goods and there is no record of delivery. It is estimated that the company faces an accumulation of $100,000 such claims. Most of them resulted from the freight and express congestion when freight service broke down.

"There was perhaps no public utility that was affected more by the war than the express companies," said Mr. Stockton. "They operated on a very close margin before the costs of virtually every factor in the service rose and it is a matter of record that no increases in rates were granted before the merger of the companies in July, 1918. The Adams Express Company lost about $10,000,000 between July 1, 1917, and July 1, 1918, a deficit equal to the capital stock. If it had not been for a reserve stowed away in its sock the company would have been bankrupt. The employees of the company were young men who were hefty and virile. They had to move heavy freight. When the war came virtually all of them were lost to the company through enlistment or the draft. Commercial companies, able to pay higher wages than the express companies, grabbed the others. The Government took away our railway express cars for its movement of troops and military stores. When the freight service broke down we were deluged with business. This had to be handled in box cars, which were neither heated nor lighted. It was necessary to load and unload frequently and this caused more labor and greater losses from breakage. The clerical costs soared and help, being inexperienced, billed goods by the wrong routes, failed to keep records carefully and caused an avalanche of claims to pile up against us. Owing to resultant disorganization we have been unable to investigate claims promptly and there are perhaps outstanding $100,000 on goods shipped prior to July 1, 1918. Shippers have flocked to our offices desiring settlement, and we have explained some of the difficulties involved. The claims are being investigated by local agents of the American Railway Express and, as it is inexpedient to have the tons of records sent here, there is, consequently, much delay.

"In a number of cases shippers are insistent on immediate settlement, for, as they state, some of the claims are of ten months' standing. Therefore we have decided to offer 60 per cent on all claims where we know we have received the goods and have not a record of delivery, or haven't yet finished the investigation to establish delivery. It is a gambler's chance, but a considerable number of firms holding claims have agreed upon the settlement at this figure. On our behalf, it should be stated that not all the claims made are valid and the percentage of valid claims will be just about 60 per cent of the number presented. If the persons holding claims want to wait until the investigations are complete and we have opportunity to check up our records, they will be paid in full. They can get 100 per cent if they will bide their time, and we think that the Adams Express Company, despite losses during war, will be able to meet all of its valid debts. This statement is based upon a study of the balance sheet and the assets of the company."

Commission and Court News

Interstate Commerce Commission

The Commission has denied the petition of Director General Hines that the Michigan percentage rate case be reopened.

The commission has awarded a hearing at Washington on May 15 on the petition of the Arkansas & Louisiana for the appointment of a board of referees to determine its compensation under the federal control act.

Classification of Lumber

The commission has announced a decision after an investigation on its own motion that:

The commission is empowered, under sections 1, 3, and 15 of the act, to prescribe a classification of lumber and lumber products. Classification should rest in the first instance upon those factors which are definite and readily ascertainable, such as value, risk, and car loading. The range of values of common lumber to such an extent embraces the values of the other article under consideration as to make impracticable and unjust a differentiation in rates based on value. This element should be considered only in fixing the basic lumber rate and its relationship to rates on commodities not so intimately related to lumber as those here under consideration. The car loading of lumber and lumber products constitutes to a considerable extent the determinative factor in their classification. A percentage relationship between lumber and articles which should take related rates will effect a fairer distribution of transportation costs than the observance of flat differentials. The present record affords no basis for prescribing different rates for different minima. Rates on lumber products should not exceed commodity rates contemporaneously maintained on lumber by more than is indicated in the lumber list suggested herein. Poles and piling from the north Pacific coast and the "inland empire" should take rates no higher than are contemporaneously applied on fir lumber.

Personnel of Commissions

W. D. Humphrey, member of the Oklahoma Corporation Commission, has resigned. In his letter Mr. Humphrey tells the governor that his resignation was due to his desire to fight the agitation for government ownership and control of public utilities without the handicap of a state office.

The Public Service Commissioner of the State of New York, for the First District (New York City), under the new law, (which reduces the number of commissioners from five to one) is Lewis Nixon, who is promoted from the position of state superintendent of public works. Mr. Nixon will temporarily also fill the office of the other commissioner who, under the law, is to supervise the construction of subway and elevated railroads in New York City. This office has been declined by Col. William Barclay Parsons. Mr. Nixon was president of the East River Bridge Commission at the time of the construction of the Manhattan bridge (1901), and has been commissioner of public works for the Borough of Richmond. He was graduated from the United States Naval Academy at Annapolis in 1882 and is known as a naval contractor, and a shipbuilder. The old Public Service commission as it goes out of office, consists of only three members, Messrs. Travis H. Whitney, F. J. H. Kracke and Charles S. Hervey.

The Miami Valley Paper Manufacturers' Association, with a membership of 20 paper companies, has adopted resolutions opposing government ownership, operation or management of the railroads, and favoring the prompt enactment by Congress of remedial legislation as advocated by Director General Walker D. Hines.

Equipment and Supplies

Locomotives

THE DAYTON & TENNESSEE RIVER RAILWAY expects to purchase shortly a standard gage oil burning locomotive. This is a new line. Jake Benkovitz may be addressed at Dayton, Tenn.

Locomotive Deliveries Week Ended April 26

Locomotives were shipped to railroads under federal control during the week ended April 26, as follows:

Works	Road	Number	Type
American	C. M. & St. P.	2	USRA Mikado
	Penn. L. W.	12	USRA St. F.
	N. & W.	9	USRA Mallet
	N. Y., N. H. & H.	4	USRA Lt. Mount.
	A. C. L.	2	USRA 6W. Sw.
	Sou. Ry.	1	USRA Lt. Mount.
	C. B. & Q.	4	USRA 6W. Sw.
		34	
Baldwin	A. T. & S. F.	3	Mountain.
	C. C. & O.	1	Mallet.
	Penn. R. R.	1	Milkado.
	C. B. & Q.	1	Mikado.
	G. N.	2	8W. Sw.
	E. J. & E.	4	8W. Sw.
	C. B. & Q.	1	USRA. Mikado.
		13	
Total		47	

Freight Cars

THE PENNSYLVANIA EQUIPMENT COMPANY, 1420 Chestnut street, Philadelphia, Pa., is in the market for 6 second-hand, standard gage, 36 or 40 ft. long, box cars.

Passenger Cars

Cars Built in Railroad Shops in March

The Railroad Administration has compiled the following statement of new cars constructed in railroad shops during the month of March:

Class of cars	Steel	Steel underframe	Steel center sills	Wood	Total
Passenger—					
Sleeping	..	..	..	..	..
Parlor	..	..	..	..	..
Dining	..	..	..	..	..
Passenger coach	..	..	..	..	..
Passenger and mail	..	..	..	..	..
Mail	..	..	..	..	..
Baggage and mail	..	..	..	..	..
Baggage	..	1	..	..	1
Express	..	..	..	..	..
Express and refrigerator	..	..	..	..	..
Horse express	..	..	..	..	..
Milk	..	..	..	..	..
Total passenger equipment	..	1	..	..	1
Freight—					
Stock	..	..	37	48	85
Hopper	..	..	3	112	115
Gondola	..	..	..	7	7
Flat	..	4	..	2	6
Coke rack	..	5	..	2	7
Work car	..	5	..	37	42
Miscellaneous freight cars	..	..	..	..	..
Caboose	4	25	6	2	37
Box	55	5	85	35	180
Refrigerator	..	..	..	4	4
Total freight equipment	59	44	131	249	483
Total passenger and freight	59	45	131	249	484

The Philadelphia & Reading has resumed the shipment of coal by water from Port Richmond, Philadelphia, to New England points. This traffic was discontinued last year when German submarines became active off the Jersey coast, and since then the company's barges have been loaded at Port Reading. In the New England service the Reading uses twelve tugs and 73 barges.

Supply Trade News

The **Joseph Dixon Crucible Company,** of Jersey City, N. J., has moved its Philadelphia, Pa., sales office from 1020 Arch street to the Finance building, South Penn Square.

F. J. Foley, recently appointed general sales agent of the **Railway Steel-Spring Company,** New York, as has already been announced in these columns, was born in Chillicothe, Ohio, on May 14, 1879. He entered the service of the Baltimore & Ohio at Newark, Ohio, as a messenger in 1892, and then until 1897, was telegraph operator and despatcher on various roads in the West. He entered the manufacturing department of the Pullman Company at Pullman, Ill., in 1897, where he remained until 1900, when he became connected with the Steel Tired Wheel Company, which company was subsequently absorbed by the Railway Steel-Spring Company in 1902. Mr. Foley has been successively manager of all of its various spring plants, and while he has occupied the position of general superintendent of the company since 1912, during much of this time he was closely associated with the sales department.

F. J. Foley

The R. W. Young Manufacturing Company, Chicago, has moved its offices from 14 East Jackson boulevard to Room 620, Railway Exchange building, Chicago.

E. R. Lewis, chief engineer of the Duluth, South Shore & Atlantic, with headquarters at Duluth, Minn., has resigned from that position to become associated with the editorial department of the Simmons-Boardman Publishing Company as an editor of the **Maintenance of Way Cyclopedia.** Mr. Lewis was born on November 20, 1869, at Raritan, N. J., and graduated from the University of Iowa in 1890. He began railway work in 1885 with the Missouri Pacific with which road he was consecutively axman and rodman on construction, levelman, clerk in the timber department, levelman on bridge location and from 1891 to 1892 division engineer. He was reclamation engineer in Wyoming from 1893 to 1895, and was then for two years division engineer on the United States Government Levees on the Mississippi River improvement work. From 1897 to 1901 and again from 1903 to 1905, he was with the state government railways in South Africa, first as locating engineer in Cape Colony, and during the last year as district engineer of maintenance at Maeking and Port Elizabeth. During 1901 and 1902, he was engineer in charge of construction on the White River division of the Missouri-Pacific, at Batesville, Ark., and division engineer on location and construction of the Fort Smith & Western in Oklahoma. He was made assistant engineer of the Keweenaw Central in 1905 and from August, 1906, to June, 1912, he was division engineer of the Michigan Central at Bay City, Mich. In July, 1912, he was appointed assistant to the general manager of the Duluth, South Shore & Atlantic, with headquarters at Duluth, Minn., and when this road was taken over by the government, he was made chief engineer, which position he held until his association with the Simmons-Boardman Publishing Company.

E. R. Lewis

As briefly noted in last week's issue, **Frank J. Tone** has been elected president and **George R. Rayner** has been elected vice president of the **Carborundum Company,** Niagara Falls, N. Y. Mr. Tone, who now becomes executive head of this Niagara Falls company and its five foreign plants, was formerly works manager, having been in charge of manufacturing operations since the establishment of the works at Niagara Falls in 1895. He was previously engaged in electric railway work in Pittsburgh. He is well known for his work in the electric furnace field on artificial abrasives, refractories and silicon alloys, and is past president of the American Electrochemical Society. Mr. Tone graduated from Cornell University in 1891. **George R. Rayner,** the new vice-president of the Carborundum Company, was born in Springfield, Mass. He served for a period of time as a member of the sales force of the Hampden Wheel Company, and in June, 1898, he was appointed manager of the Chicago branch of the Carborundum Company. In August of the same year he was transferred to Niagara Falls, and was appointed secretary and general sales manager of the company. Mr. Rayner is a past president of the American Foundry & Supply Association and is a member of the board of directors of the Chamber of Commerce, at Niagara Falls.

F. J. Tone

G. R. Rayner

The Van Dorn Electric Tool Company, Cleveland, Ohio, has opened a Chicago office at 527 South Dearborn street, in charge of **William Cottrell,** sales manager.

L. V. Estes, Incorporated, industrial engineers and accountants, Chicago, has removed its offices from the McCormick building to the Century building, 202 South State street.

The **Van Dorn & Dutton Company,** Cleveland, Ohio, has opened branch offices at New York and Chicago. **Harry F. Keegan** will manage the Chicago branch, with office at 1241

First National Bank building, and his brother, **John Keegan,** will manage the New York branch, with office at Room 317, 30 Church street.

H. M. Davison, for the past 14 years connected with the sales organization of the Hayward Company, has left that company to become sales manager of the **Ohio Locomotive Crane Company,** Bucyrus, Ohio.

Frank E. Wade, president of the **Fairmont Gas Engine & Railway Motor Car Company,** Fairmont, Minn., and mayor of that city, died after a short illness at his home in Fairmont on March 3. He was born at Whitehall, Wis., March 6, 1862, and received his education in the Curtis Business College, at St. Paul, Mill. He received considerable engineering training under C. F. Loweth, now chief engineer of the Chicago, Milwaukee & St. Paul, and in 1881 entered the employment of the G. W. Sherwood Co., at St. Paul, as superintendent in charge of bridge construction. With this firm he was connected with the building of bridges along the Mississippi river. Later, he entered the employ of Fairbanks, Morse & Co., Chicago, as general salesman. From 1902 to 1906 he was interested in mining properties in the Black Hills district of North Dakota, returning to Fairmont in 1906, where he became interested in the Fairmont Gas Engine & Railway Motor Car Company several years later. Mr. Wade was also interested in many banking projects in the Northwest, and in Florida and Mexico lands.

F. E. Wade

The Standard Car Wheel Company, Cleveland, Ohio, has increased its preferred capital stock by $100,000 for the purpose of capitalizing the 1917-1918 enlargements to its plant, at Cleveland. No construction is contemplated at this time.

Donald M. Ryerson, who for the past two years has been in the United States Navy, has received his discharge from the service and has returned to his duties as vice-president in charge of purchases and sales of the **Joseph T. Ryerson & Son Company,** Chicago.

J. N. Ebling, recently returned from France, after having spent 13 months with the American Expeditionary Forces, has resumed his position as president of the **Railway Specialties Corporation,** New York. **D. A. Munro,** formerly secretary, is no longer connected with the corporation.

Edwin R. Webster, until recently assistant engineer on the Iowa, Dubuque, Des Moines and Dakota divisions of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, has taken up private practice in general, civil, sanitary and structural engineering, with offices in the Webster building, Chicago.

The Chicago Pneumatic Tool Company, Chicago, has sold its Giant truck department, consisting of the Chicago Heights plant, stock of trucks finished and in process of construction, and the agencies and branches with their stock. The truck business will be continued by the purchasers, probably under the title of the **Giant Truck Corporation.**

Marcel E. Cartier, sales engineer of the **Joseph T. Ryerson & Son Company,** Chicago, with headquarters at Paris, **France,** has returned to France after a few weeks' visit in this country. He will be joined in Paris by **John H. Romann,** sales engineer of the same firm. Messrs. Cartier and Romann will have charge of the company's business in France, Belgium, Holland, Switzerland, Italy, Spain and Portugal.

The manufacturing facilities of the **U. S. Light & Heat Corporation,** Niagara Falls, N. Y., are to be increased by the addition of several buildings. The plant space now covers about nine acres and consists of 22 buildings. Recently, two structures of brick and concrete were added. Contracts have been let and construction is already under way on the new buildings which will be of reinforced concrete and brick.

Stone Franklin Company

The Stone Franklin Company has been organized to market the Stone Franklin car lighting system in the United States and Canada. This system was introduced into this country by the Franklin Railway Supply Company. The new company has elected the following officers: Joel S. Coffin, chairman of the board of directors; Ralph G. Coburn, president; C. E. Walker, vice-president; H. D. Rohman, chief engineer, and W. Truelove, secretary, with offices at 18 East Forty-first street, New York.

Ralph G. Coburn, president of the new company, has been identified with the Franklin Railway Supply Company. He was born at Boston in 1882, and graduated from Harvard in 1904. From 1904 to 1909 he was in the service of the American Glue Company, having charge of its western factories with his headquarters at Des Moines, Ia., and Chicago. On May 1, 1909, he opened the Chicago office of the Franklin Railway Supply Company as resident sales manager. On June 1, 1911, he was made assistant to the vice-president, in charge of eastern-southern territory, with headquarters at New York. In December, 1913, he was appointed eastern sales manager of the Franklin Railway Supply Company, which position he held until his appointment with the Stone Franklin Company.

R. G. Coburn

Charles C. Walker, vice-president of the new company, has had a broad experience in industrial manufacturing, sales and railroad work both in this country and abroad. He is a graduate of the engineering course of the University College, of Bristol, England. He served as an apprentice with the Bristol Railway Carriage Company and as junior assistant on the staff of the Newcastle Electric Supply Company. He later went to South America on the mechanical constructional staff of the Buenos Ayres & Pacific Railroad. While in South America he joined J. Stone & Co., Ltd., as technical adviser and sales manager with office in Buenos Ayres. In the latter part of 1912 he went to England to take charge of foreign sales in the main office at London. When war was declared he joined the British army and saw active service at the front for nearly three years. Receiving the order of the British Empire in February, 1917, he was returned to England to take charge of

C. E. Walker

the manufacture of anti-submarine devices, which is the work he leaves to take up the position of vice-presiednt of the Stone Franklin Company.

Harry D. Rohman, chief engineer of the Stone Franklin Company, New York, is a graduate of the technical schools of Zurich, Switzerland. Upon graduation he entered the works of the Oerlikon Electrical Construction Company, and in 1903 qualified as an electrical engineer, with experience in high and low tension and a. c. and d. c. work, especially electrical traction. Later he entered the service of J. Stone & Co., London, and in 1910 was appointed chief of the testing and experimental departments. In 1914 he was appointed chief assistant electrical engineer, and held that position until October 1, 1915, when he entered the service of the Franklin Railway Supply Company as chief electrical engineer, which position he held at the time of his recent appointment. Mr. Rohman speaks several languages and has had an extensive experience in all European countries, as well as in South Africa and the Belgian Congo. He has a broad experience in car lighting engineering, obtained by many years of active work in that field.

H. D. Rohman

Sale of Surplus Property by the Government

The general policies of the War Department in the disposal of surplus property, were enunciated by C. W. Hare, Director of Sales, to a committee representing the trade and technical papers of the country, at a recent meeting in Washington.

Mr. Hare stated that the War Department would dispose of its surplus materials by first consulting with the various branches of the government to ascertain what, if any, could be utilized in regular government work. After the government requirements have been satisfied, the producers of each particular commodity will be called into conference to advise with the Director of Sales as to the best method of getting the remaining amount of the commodity back into the usual channels of trade.

If, as has been the case in the disposal of copper, sulphur, lead, wool and lumber surplus stocks, the industry is able to contract with the government to dispose of its surplus within a reasonable length of time, paying the government the current market prices, it would be the policy of the government to make such an arrangement.

Should both of the methods mentioned fail, the surplus property will be offered to the general public through auction sales, or by sealed bids, or in any other manner which will enable the government to obtain the best prices.

A Sales Promotion Section has been established under the supervision of T. R. Elcock, Jr., to collect all information pertaining to the disposition of surplus property and to see that appropriate information reaches interested industries through the proper trade and technical papers.

Trade Publications

EXPLOSIVES.—E. I. du Pont de Nemours & Co., Wilmington, Del., manufacturers of explosives, have issued an interesting and instructive eight-page booklet on the use of explosives in blasting concrete. It describes in detail new and economical methods of removing old walls, breaking up engine beds and excavating concrete foundations. One page is devoted to short descriptions of the actual application of explosives to work of this character and the illustrations show in a graphic way the contrast between the old and new methods.

Financial and Construction

Railway Financial News

ANN ARBOR.—President Newman Erb announced recently that arrangements have been completed with the War Finance Corporation under which two alternative proposals are made to the holders of the company's $622,000 notes maturing May 1. The offers are made through F. J. Lisman & Co., as follows:

(a) Cash payment of 20 per cent of the face amount of notes with an extension of the balance for a further period of two years at 6 per cent plus a payment of 2½ per cent in cash on such extended portion.

(b) Extension of the full face amount of the notes for a further period of two years at 6 per cent interest, with a payment of 2½ per cent in cash on said notes.

In addition to their present collateral the notes are to be further secured by the deposit of $500,000 face value of the company's improvement and extension 5 per cent bonds. Noteholders wishing to avail themselves of either offer are asked to deposit their notes with the Empire Trust Company.

DELAWARE & HUDSON.—See editorial elsewhere in this issue.

MISSOURI, KANSAS & TEXAS.—James Speyer has been elected a director to succeed Horace E. Andrews, deceased, and Samuel E. Kilner, of New York, has been elected a member of the board to represent the English interests in the company.

NEW YORK CENTRAL.—The United States Supreme Court on Monday declined to review the decision of a lower court which had failed to sustain the petition of Clarence H. Venner, a stockholder, attacking the consolidation of the New York Central & Hudson River Railroad with the Lake Shore & Michigan Southern and nine other subsidiary railroads.

NEW YORK, NEW HAVEN & HARTFORD.—The list of stockholders of this road on April 16 shows that many of the large corporations, as well as individual stockholders of a year ago, have disposed of a large part of their holdings. Among the most important changes are the American Express Company, which this year held only 625 shares of stock, as compared with 20,324 in 1918, and the Adams Express Company, which reduced its block of 24,730 shares in 1918 to 14,730 in 1919.

WESTERN PACIFIC.—Director General Hines has authorized this company to declare and pay a dividend of 1 per cent on its preferred stock. This is the dividend which would ordinarily have been paid on April 1.

Railway Construction

SIOUX CITY STOCK YARDS COMPANY.—Two new terminal yards costing approximately $150,000 will be built at Sioux City, Iowa, this spring to facilitate the delivery of livestock. The terminals will have a combined capacity of 600 cars.

SOUTHERN RAILROAD.—This road is carrying out improvements to the bridge near Spencer, N. C., over the Yadkin river, at mile post 330.8, to consist of four single track deck riveted steel spans about 160 ft. long for Cooper's E-60 loading. Repairs will be made to some of the present masonry; estimated cost for the entire work is about $170,000. The American Bridge Company has the contract for fabricating and erecting the superstructure.

ERIE RAILROAD, THE BALTIMORE & OHIO LINES AND THE PENNSYLVANIA LINES WEST.—These roads have entered into an agreement with the city of Akron, Ohio, for the elimination of certain grade crossings in that city. The first step provided for in the agreement is the construction of a temporary structure over the East Miller avenue crossing to cost about $135,000. The whole of this work will cost about $4,000,000, to be divided on the basis of 65 per cent to the railroads and 35 per cent to the city.

ANNUAL REPORT

The Delaware and Hudson Company.

New York, N. Y., April 1, 1919.

To the Stockholders of
The Delaware and Hudson Company:

The following presents the income account of your Company for the year 1918, arranged in accordance with the rules promulgated by the Interstate Commerce Commission, with comparative results for the year 1917:

	1918.	Comparison with 1917. Increase.	Decrease.
Compensation accrued under Federal Control (on basis of Standard Return) for possession, use and control of railway property of the Company and its leased and operated lines	$7,415,148.72	$1,805,761.95	.....
Other Corporate Income:			
Miscellaneous rent income	$137,197.51	.....	$649.88
Income from lease of road	102,822.97	.....	7,682.35
Miscellaneous non-operating physical property	22,501.10	6,529.18	.....
Dividend income	938,163.10	.....	54,243.17
Income from funded securities	225,232.83	59,272.77	.....
Income from unfunded securities and accounts	447,099.95	207,217.83	.....
Income from sinking and other reserve funds	162,168.13	53,005.80	.....
Miscellaneous Income	1,152,446.28	.....	1,560,079.49
Total Other Corporate Income	$3,187,631.87	.....	$1,296,629.31
Gross Income	$10,602,780.59	$509,132.64	.....
Deductions from Gross Income:			
Railway operating expenses	$95,770.45	$95,770.45	.....
War taxes	127,027.52	112,899.30	.....
Miscellaneous tax accruals	17,636.27	1,518.12	.....
Rent for leased roads	1,946,986.08	.....	$9,075.63
Miscellaneous rents	.....	.....	2,658.71
Interest on funded debt	2,938,318.26	12,959.92	.....
Interest on unfunded debt	142,728.01	.....	26,371.16
Miscellaneous income charges	619,521.57	602,077.47	.....
Total Deductions from Gross Income	$5,887,988.16	$787,119.76	.....
Net Income—The D. & H. Co. carried to general profit and loss	$4,714,792.43	.....	$277,987.12
Percentage to capital stock	11.09	.....	.66

FINANCIAL.

The capital stock of The Delaware and Hudson Company on December 31, 1918, was $42,503,000, there having been no change during the year.

The total funded debt on December 31, 1918, was $66,010,000, a reduction of $452,000 having been effected during the year by the purchase and cancellation of that amount of First Lien Equipment bonds through the sinking fund established in connection with their issue.

The sum of $395,040, being one per cent of the par value of the First and Refunding Mortgage Gold Bonds outstanding on June 1, 1918, was paid during the year to the trustee under the First and Refunding Mortgage, making the total paid to December 31, 1918, $2,846,150. This amount has been expended in additions and betterments to the mortgaged property in accordance with the trust agreement.

There was accumulated in the Coal Department Sinking Fund during the year, in accordance with the ordinance passed on May 9, 1899, and amended on May 10, 1910, $384,195.56, which has been applied to reimburse the treasury for coal lands and unmined coal in Pennsylvania.

The usual payment of $650,000, required under the terms of the First Lien Equipment Trust indenture, was made, making the total paid to date $7,150,000. This has been increased by accumulations of interest on balances and investments. During the year 1918, $1,288,703.65 was expended for new equipment, which was made subject to the indenture, leaving in the hands of the Trustee, securities and cash to the amount of $2,387,393.83.

During the year there was received from the United States, in partial payment of compensation for the taking over of the company's property in December, 1917, and its subsequent occupation and use by the United States, the sum of $4,190,000, and the company borrowed from the Railroad Administration, without security, $2,100,000; making a total of $6,290,000. The Interstate Commerce Commission has certified to the President, under the Act of March 21, 1918, that the average income of this company for the three years that ended with June 30, 1917, was $7,409,600.12. If the latter sum is all to which your company is entitled, which is by no means admitted, it has received $1,119,600.12, or 15.11 per cent less than it should have received to December 31, 1918.

The changes in Current Assets and Current Liabilities are largely due to the Government taking possession and control of the Company's railway property as a going concern, the Government collecting the major portion of the current assets and paying the major portion of the current liabilities.

COAL MINING DEPARTMENT.

The anthracite produced by The Hudson Coal Company during 1918, including the product of washeries, aggregated 9,059,228 long tons, an increase of 415,505 tons, or 4.81 per cent over 1917. The year's output was 11.82 per cent of the total output of Pennsylvania mines and washeries, which was 76,649,918 long tons. The number of breaker-hours required for the preparation of this coal was 55,191.

Throughout 1918, the United States Fuel Administration continued to urge the maximum possible production and those in charge of your operations made every practicable effort to meet their wishes. Underground development was carried on during the year and the properties were fully maintained.

The wages agreements effected during 1917 and explained fully in the report for last year made full provision, according to their terms, for the whole period to March 31, 1920. Nevertheless, during 1918, a further increase was urged upon the operators and after conferences in which the Fuel Administration, as representative of the Federal government, and the employees, participated, a supplementary agreement providing for very heavy increases in wages rates and effective from November 1, 1918, to the end of the war or until March 31, 1920, if peace is not declared prior to that date, was effected. In consideration of the effect of these increases in wages upon the cost of production, the Fuel Administration authorized an increase of $1.05 per ton in the price of pea coal and all larger sizes.

A statement, in regard to prices, issued by the Fuel Administration during February, 1919, when about to relinquish most of its functions, states plainly its conclusion that the prices of anthracite are still too low. The following is quoted:

"By his executive order of August 23, 1917, the President adopted as maximum prices for anthracite coal, the schedule of prices which had been acquiesced in by the industry while under investigation by the Federal Trade Commission under the so-called 'Calder' resolution of the Senate. This involved one price for the railroad-controlled coal companies and a price 75 cents higher for the individuals. With the exception of a reduction of 60 cents a ton in the prices for pea coal made October 1, 1917, and two adjustments to cover increases in miners' wages, the Fuel Administration allowed the prices fixed by the President to stand pending examination of costs such as were made in the case of bituminous coal.

"For the purpose of arriving at a fair increase in price to cover the increase in wages, recommended by the War Labor Board last October, an examination was made to determine the costs of the various anthracite-producing companies. The result of this examination showed that the general incerases in the price of materials and labor had raised the cost of mining anthracite to such an extent that many of the companies were not receiving a fair return and that some producers of necessary coal were actually sustaining a loss on the sale of coal at the government prices, in spite of two increases allowed on account of advances to labor.

"At the time this situation was discovered every indication pointed to an early peace and it was deemed unwise to increase the maximum prices so near the time when, on account of the end of the war, price restrictions would, in the natural course of events, be lifted entirely.

"The above statement is made at this time, when price restrictions are about to be lifted, out of fairness to those companies who have patriotically kept up their production to war needs, even at a cost which resulted in many instances in a loss, not only by the individuals, but also by some of the railroad companies, so that the impression shall not exist that the government prices of anthracite coal in existence at the time of the lifting of restrictions were prices which the Fuel Administration had fixed on the basis of cost to the operators.

"Had the Fuel Administration's active control over maximum prices on anthracite coal been continued, the cost examination above referred to shows that it would have been necessary, on the basis of the present wage scale, to raise these maximum prices possibly as much as 50 cents a ton above those last fixed by the government in order to prevent financial embarrassment and perhaps the closing of companies producing a substantial per cent of the necessary anthracite output.

"Such a curtailment of production would eventually result in the demand exceeding the supply to such an extent as to increase the prices much higher than they would be if that supply were continued."

The increase in prices suggested by the Fuel Administration, relates solely to domestic sizes. The reduction in prices of other fuels which compete with anthracite steam sizes have necessitated some reduction in the latter. Therefore, an increase of fifty cents per ton in the price of domestic sizes will secure to The Delaware and Hudson Company and The Hudson Coal Company an increase of only 23.55 cents per ton of all sizes produced and marketed.

RAILROAD DEPARTMENT.

Late in December, 1917, the President of the United States conceived it to be his duty to take possession of substantially all railways engaged in interstate transportation, together with affiliated boat lines. Your railway property, and that of your system corporations in the United States, with the boats operated on Lake Champlain and Lake George, were included in this exercise of power and passed out of your control at noon on December 28, 1917. Since that date these properties have been operated, in accordance with the President's proclamation of December 26, 1917, and the Act of Congress of March 21, 1918, for the account of the United States, which have assumed responsibility for all expenses of operation, including maintenance, and all taxes, except war taxes, and have become liable to your company for whatever just compensation may be provided for in any contract negotiated in pursuance of the Act or otherwise determined in accordance with the statutes and the Constitution.

Under this condition the income account of your company for 1918 was not affected by the operating revenues, operating expenses or the ordinary exactions of the taxing authorities. Your interest in the operating results obtained by the Railroad Administration is, therefore, indirect and restricted to their implications as to operations after the anticipated restoration of the properties to your direct control.

Data supplied by the Railroad Administration indicate that the operating revenues of The Delaware and Hudson Company's Railway for 1918 amounted to $34,789,864, an increase of $4,800,465, or 16.01 per cent over 1917. Freight receipts increased $4,757,563, or 18.77 per cent and passenger receipts *decreased* $232,007 or 7.64 per cent.

Freight movement increased from 3,954,096,760 ton miles, in 1917, to 4,062,078,074 ton miles, in 1918; a gain of 107,981,314 ton miles or 2.73 per cent, while the average receipts per ton per mile increased from 6.41 mills to 7.41 mills, a gain of 15.60 per cent.

The increased freight movement was principally in anthracite, food products and munitions of war. The Railroad Administration assumed a control over routing of traffic never exercised by railways under corporate management, generally refusing to permit shippers to select routes or to choose the delivering lines and not only diverted to your railway, in order to relieve actual or threatened congestion at New York harbor, and elsewhere, considerable traffic that would otherwise have moved differently but, also, diverted from your lines numerous shipments which they would normally have carried.

Several changes, of which the following are considered the most important, contributed to the increase in the average receipts per ton per mile:

(1) Advances in freight rates applicable to anthracite moving to Canadian destinations, cement, stone, sand and similar commodities, asked for in 1917, were sanctioned by the Interstate Commerce Commission and permitted to go into effect on April 1, 1918.

(2) On June 25, 1918, the Railroad Administration began to enforce an increase of twenty-five per cent applicable to all classified freight with increases roughly corresponding to that percentage on all other articles. Coal rates, for both anthracite and bituminous coal, were advanced on a scale commencing with fifteen cents per ton as to rates formerly under forty-nine cents per ton and ending with fifty cents per ton as to all rates formerly $3.00 per ton or higher. Rates applicable to coke took a scale of advances running from fifteen cents to seventy-five cents per ton, the minimum increase applying where the former rate was forty-nine cents or less and the maximum where it was $3.00 or more. Rates on ores, except ex-lake ores, were increased thirty cents per ton; cement and stone rates, two cents per hundred pounds; lumber rates, twenty-five per cent but not over five cents per hundred pounds; grain rates, twenty-five per cent but not over six cents per hundred pounds; cotton rates, fifteen cents per hundred pounds. All commodity rates not specifically indicated were increased twenty-five per cent. The minimum charge for any less than carload shipment was raised to fifty cents; the previous minima had been twenty-five, thirty and forty cents for different kinds of shipments. The minimum charge for a car-load shipment was increased to $15.00, superseding many much lower minima. Before these increases were made, an estimate, based on 1917 traffic, indicated that they would add about $5,900,000 to annual gross receipts.

(3) The Railroad Administration adopted and has applied since May 1, 1918, a basis for the apportionment of interline revenues, differing from the former system resting upon contractual relations between connecting carriers. While primarily adopted to reduce the labor of accounting, this change is understood to have increased the revenue attributed to your railway under Federal operation. Other changes in interline relations, such as the discontinuance of adjusting overcharges and undercharges in settlements, are considered to have had similar results.

From data furnished by the United States Railroad Administration, it would appear that the movement of passengers over your lines *decreased* 13.45 per cent, the passenger mileage being 112,180,679 compared with 129,620,729 in 1917, and the average receipts per passenger mile increased 6.75 per cent from 2.342 cents in 1917 to 2.500 cents in 1918. Passenger train mileage was, however, reduced 22.57 per cent from 2,660,310 in 1917 to 2,059,990 in 1918, and passenger car miles 24.59 per cent from 13,080,801 to 9,864,219. Passenger receipts per passenger train mile increased 19.30 per cent from $1.14 to $1.36, and receipts per passenger car mile increased 22.49 per cent from 23.21 cents to 28.43 cents.

The decrease in passenger travel indicated by the foregoing is probably attributable to direct efforts to discourage unnecessary passenger movement, as well as to increased charges and withdrawal of facilities furnished under corporate management. One aspect of the reduction of facilities is indicated by the decrease in revenue from parlor and chair car service from $10,340 in 1917 to $3,954 in 1918.

The increase in the average rate per passenger mile resulted from the increase of the basic mileage rate to three cents, effective on June 10, 1918, modified, however, by the allowance of a special rate of one cent per mile to soldiers and sailors on furlough.

There was a considerable increase in miscellaneous transportation revenue, due to augmented switching charges, and incidental revenues were increased by a gain of 109.98 per cent in the demurrage charges collected, which amounted to $345,925 as compared with $164,744 in 1917. Prior to February 10, 1918, the original rate for demurrage of $1.00 per day, regardless of the length of detention, had been superseded by a rate of $2.00 per day for the first five days, with a rate of $5.00 per day thereafter. On the date named the rates were increased to $3.00 per day for the first four days, $6.00 per day for the next three days, and $10.00 per day thereafter. These increased charges had a beneficial effect in expediting the movement of cars when a shortage of equipment appeared imminent, and tend strongly toward the elimination of a misuse of facilities that is at all times wasteful.

Operating expenses amounted to $31,353,784, as compared with $23,449,953 in 1917, an increase of $7,903,831, or 33.71 per cent. Subtracting the increase in revenues of $4,800,465 leaves a *decrease* in operating income, before the deduction for taxes, of *$3,103,366*. Expenditures for maintenance of way and structures increased $1,215,554; for maintenance of equipment, $2,873,831; for transportation, $3,809,887.

The following figures, which should be understood as approximate only, indicate, as closely as computations now practicable permit, the relation of the various changes in operating conditions to the total increase of $7,903,831 in expenses:

Increase due to	Amount	Per cent of total increase	Per cent of total operating expenses
Higher wage rates	$4,345,025	54.97	13.86
Increased number of employees	1,700,000	21.51	5.42
Higher prices of materials	1,043,183	13.20	3.33
Increased quantities of materials and miscelianeous	815,623	10.32	2.60
Total	$7,903,831	100.00	25.21

Considerably more than one-half the increase in expenses, and almost one-seventh of the total operating cost of the year, is attributable, therefore, to higher rates of wages than were in force in 1917. The new scale of wages, with changes in hours and working conditions, which has had this result, was put in force by General Order No. 27 issued by the Railroad Administration. This order established eight hours as the basic day for all classes of labor and in many instances provided bonuses for time in excess of eight hours or in excess of the number of hours which had theretofore constituted a day. The following table shows some of the typical and controlling rates in comparison with those in force in 1917:

Employees	Rate per Hour, in Cents 1917	1918
Machinists	40	68
Boilermakers	45	68
Blacksmiths	43	68
Tinsmiths	43.25	68
Pipe fitters	43	68
Car repairers	27.25	58
Carpenters, locomotive and coach	30 to 34	68
Car inspectors	29.75	58
Laborers	23	35
Section foremen	77.50*	102.49*
Sectionmen	22.5 to 23.5	40
Carpenters, bridge and building	30	53
Signal repairers	34	68
Station laborers	23	35.5
Engineers:‡		
Freight	63	73
Passenger	74	87
Mixed	62.5	73
Yard	54	67
Firemen:‡		
Freight	41.5	56
Passenger	45	63
Mixed	40.5	52.6
Yard	34	47.2
Conductors:‡		
Freight	52.6	63
Passenger	68.7	83.5
Mixed	58	77
Yard	48.7	63.6
Brakemen:‡		
Freight	35	49
Passenger†	41	59
Mixed	39	55
Yard	45	60

* Dollars per month. † Includes other trainmen.
‡ Averages for all classes of engines and service.

Increases of $25.00 per month over the pay received on January 1, 1918, with a minimum of $87.50 per month, were also granted to all employees who were receiving on January 1, 1918, prior to the application of General Order No. 27, a basic rate of $62.50 per month and devoting major portions of their time to clerical work of any character, including not only clerks, but also train announcers, gatemen, checkers, baggage and parcel-room employees, callers for train and engine crews, etc. Substantially all the increases noted were made retroactive to January 1, 1918, thus requiring heavy payments to adjust the wages actually paid during the early months to the new standards.

Apparently the operating expenses thus stated are still subject to increases on account of further wage increases which are under discussion, and that are likely to be made retroactive at least to September 1, 1918. These projects include an increase of approximately 15 per cent in favor of engine and train crews with, in addition, provision for payment at one and one-half times the standard rates, instead of proportionately, for all time in excess of eight hours, and an increase in favor of telegraphers.

INDUSTRIAL DEPARTMENT.

Fifty-nine new industries were located on the tracks of your Company during 1918, as compared with one hundred in 1917. Twenty-six extensions to old industries and seventeen industrial side tracks were constructed; the corresponding numbers for 1917 were forty-nine and thirty-eight, respectively. During the year the Federal management cancelled all memberships maintained by your railway in commercial organizations, eliminated substantially all advertising of the Industrial Department and practically suspended its normal activities. The work permitted related almost exclusively to agricultural development, in which some progress is reported.

ADDITIONS AND BETTERMENTS.

One of the early decisions of the Railroad Administration was to provide for a reconsideration, by an agency of its own, of every program for additions and betterments that had been approved and adopted by the owners of the properties which had been taken under Federal control. As applied to your railway, this reconsideration resulted in determination to continue most of the work in progress at the end of 1917, with the exception, however, of the new third track between Schenevus and Richmondville Summit, which was under construction as a principal feature of the general grade revision between Oneonta and Mohawk Yard. The omission of this portion of the plan for adapting this part of your railway to the movement of trains of heavier tonnage would so seriously reduce the benefits obtained by heavy capital expenditures at other points, in addition to rendering useless the considerable outlay upon the particular project, that it was deemed necessary to request a rehearing, which was accorded. Upon this rehearing the former action was reversed. But before this occurred the contractors had been paid and the work stopped. The completion of the work during 1918 was, therefore, held to be impracticable, and nothing was done toward its resumption. To the end of 1917 the total expenditure on this third track was $414,555.74, and the amount paid in the settlement with the contractors when the work was suspended was $125,770.09, so that it now represents a capital investment of $540,325.83, all of which remains idle and unproductive. The suspension of this improvement has also involved losses in the necessary adjustments with contractors and the natural deterioration resulting from the exposure to erosion of unfinished grading. This interruption of the development program led to the postponement of the grade reduction between Cobleskill and Barnerville, which was authorized in 1917, but could not be placed in operation until the completion of this section of the third track. The Railroad Administration also determined not to continue during 1918

the erection of new stations or the elimination of grade crossings in accordance with the ordinary program for the general development of your property.

From Nineveh to Windsor, a distance of nine and one-half miles on the Nineveh Branch, a new second track was completed and placed in operation during June. During the year $305,031.63 was expended on this work, of which $297,373.20 was charged to cost of property and $7,658.43 to operating expenses. A new second track between Lanesboro and State Line, a distance of 2.3 miles, was undertaken and the grading completed, at a cost of $93,122.26, of which $86,522.21 was for new capital and $6,600.05 for operating expenses. Bridge-work and track laying should be completed early in 1919.

The new third track between Oneonta and Cooperstown Junction, six miles, and the revision of grades between Schenevus and Cooperstown Junction, nine miles, referred to in last year's report, were finished during 1918. The cost, $540,325.83, included $511,775.28, chargeable to cost of property and $28,550.55 chargeable to operating expenses.

The enlargement and rearrangement of the Carbondale Yard, in progress for several years, was substantially advanced and placed in operation during the year. Changes yet to be made at the southern end, near Dundaff Street, will be undertaken when the grade crossing at that point can be eliminated. An enlarged yard office is now under construction. This yard now has a capacity of 3,139 cars, an increase of substantially 50 per cent over the former capacity of 2,100 cars. The expenditure during the year was $89,481.38, of which $66,317.97 was a capital expense and $23,163.41 a charge to operating expenses.

At Whitehall, three sidings with capacity for eighty cars each, were completed during October, providing storage space that was greatly needed. The expense was $41,925.22, of which $39,929.45 was charged to cost of property and $1,995.77 to operating expenses.

At Rouses Point additional yard tracks are under construction. The grading was practically completed during October and they should be in service early in 1919. The expenditure was $24,405.95.

At Fort Edward additional land was purchased, the engine house enlarged, a new ash pit and coaling platform constructed, and a rearrangement of tracks is in progress. The expenditure of $18,856.69 was distributed in the sum of $17,970.19 to cost of property and $886.50 to operating expenses.

At the Colonie shops, the installation of two new 400 horse-power boilers, mentioned in 1917, was completed at a total cost of $22,956.18, of which $22,922.93 represents new capital and $33.25 operating expenses.

The addition to the general office building at Albany was completed during 1918 and occupation began in May. The whole building, modern in construction and equipment, and suitable for your corporate purposes, now supplies office space of 189,079 square feet. The addition to its cost during 1918 was $50,516.19.

Other improvements to your property include new water tanks for locomotives, with capacity for 100,000 gallons each, at Central Bridge and Rouses Point; a restaurant and women's rest-room at Colonie shops; a "Wye" track for turning locomotives at Delanson; a new freight station at Mechanicville, begun before 1918; in addition to the freight station at Glens Falls; reconstruction of heating systems in round houses at Wilkes-Barre, Green Ridge, Carbondale, Oneonta, Mohawk, Whitehall and Rouses Point and in other buildings at Green Ridge, Carbondale and Oneonta, this reconstruction to be completed early in 1919.

Heavy repairs to 3,434 freight train cars, including the application of Economy draft arms, 5 x 7 couplers and heavy friction springs, referred to in the report for 1917, were continued during 1918 and are approximately two-thirds completed. The equipment of two hundred steel underframe flat cars with temporary sides and removable drop-ends was completed. All freight train cars must be equipped with safety appliances approved by the Interstate Commerce Commission not later than September 1, 1919; of 18,794 cars, 18,534, or 98.62 per cent, have received this equipment. A statute requiring the equipment of locomotives with electric headlights by July 1, 1920, was the occasion of the equipment in that manner of 123 locomotives. By the same date all cabooses operated in New York must have eight wheels and steel under-frames; 84 out of 212 such cars have received this equipment and 72 are to be provided for during 1919. The conversion of 135 wooden underframe gondolas into company service cars is in progress and about 38 per cent completed. Application of "Z" bar reinforced ends to 500 box cars is in progress and about one-third completed, and raising of the sides and ends of 500 low-side gondolas is proceeding and about 82 per cent completed.

FEDERAL VALUATION.

The valuation of your railway property in accordance with the statute of 1913, by the Interstate Commerce Commission, progressed during the year somewhat more slowly than in 1917. The depletion of the office force of the Commission owing to military necessities is assigned as the reason for reduced effort. Most of the field work, except the building and equipment inventory and the appraisal of lands has been completed. The completion of all inventories before the end of 1919 and a final report from the Commission during the ensuing twelve months are considered possible—perhaps probable. The cost of this work, to the end of 1918, amounted to $362,342.15, of which $302,934.56 was charged to corporate operating expenses to December 31, 1918, and $59,407.59 to the operating expenses of the Railroad Administration during 1918.

LITIGATION.

In the suit of Katherine S. Weld and others, for an accounting of royalties under the lease of coal lands made to the company in 1859 by Henry B. Rockwell, the decision of the referee, on which judgment was entered on September 24, 1918, awarded the sum of $429,153.60 to the plaintiffs. Appeal was taken but, pending the appeal, a proposal for settlement was received and negotiations are in progress which may lead to a settlement.

The proceeding instituted by The Rensselaer and Saratoga Railroad Company, referred to in the report for 1917, against the United States Collector of Internal Revenue and your company for the purpose of requiring the deduction from the dividend payments which your company is required to make to the stockholders of the former corporation, as a part of the rental for its property, the amounts due to the United States as income tax thereon, was dismissed by the United States District Court. Appeal to the Circuit Court of Appeals was taken and has been argued and is now awaiting decision.

The action begun in August, 1916, by the Mechanicville and Fort Edward Railroad Company, a subsidiary of your company, against the Fitchburg Railroad Company and its lessee, the Boston and Maine Railroad Company, to determine the title to the railway and right of way extending northward from Mechanicville, in Saratoga County, and decided adversely to your company by the trial court, is now awaiting argument on the appeal to the Appellate Division.

In the suit of The Ticonderoga Railroad Company against your company for an accounting under the contract for the operation of the former, the referee determined the amount of the fund to be accounted for as of December 3, 1914, to be $186,221.31. An appeal from this award has been taken by your company and there is a cross-appeal on the part of the plaintiff. Determination of these appeals by the Appellate Division is anticipated during the year 1919.

GENERAL REMARKS.

The temporary relinquishment of possession of your railway property to the Federal Government suggests a review of the eleven years' period of development which began in 1907. Within a brief period which ended with the year 1906 or early in 1907, there had been acquired in your interest additional coal lands in Schuylkill County of large extent, your present Canadian railway holdings, as well as additional railway properties in New York, and your interests in street and interurban electric railways, greatly expanding your several interests. This expansion had not been currently financed, and adequate provision therefor, as well as for future development, was the first problem which confronted your present management. It was met by the issue of the First Lien Equipment Bonds of 1922, bearing date as of July 1, 1907, and the First and Refunding Mortgage Gold Bonds of 1943, issued as of July, 1908. These provisions made it practicable to consider the improvement and better adaptation of your railway to the economic potentialities of the communities and industries which it serves.

While your company was the first to operate a steam locomotive on the American continent, and in 1917 was probably the oldest American corporation operating a railway under its original charter, its common carrier functions were, until a few years ago, secondary to its function as a producer of fuel. Its railway system was inaugurated and expanded as an agency for the marketing of its anthracite, and the common carrier duties which it undertook were merely incidental to this principal purpose. As recently as February 19, 1906, the Supreme Court of the United States, deciding the matter of *Interstate Commerce Commission* v. *Chesapeake & Ohio Railway* (200 *U. S.* 361), determined that a corporation which was at once a common carrier and an extensive owner of coal lands could not be charged with unjust discrimination in respect to any transportation undertaken for its own account as a producer, and although the commodities clause of the Hepburn law was made by its terms to take effect on May 1, 1908, it was at first held to be unconstitutional (164 *Fed.* 215) and did not become actually effective until after the decision of the Supreme Court in *United States* v. *Delaware and Hudson Company* (213 *U. S.* 366), which was rendered on May 3, 1909. This decision sanctioned the relations then existing between your railroad and coal departments although for the first time it was held, in that case, that your company is a "railroad company" within the intendments of such a statute (213 *U. S.* 417-8). From the date of the last mentioned decision it became desirable to develop the common carrier functions of your railway upon lines wholly independent of your interest as a coal-producing enterprise.

Modernization of motive power began in 1907 with the adoption of a new and heavier type of freight locomotive, known as the E-5 locomotive, which is of the consolidation type with a weight on the drivers of 227,000 pounds. Ninety of these locomotives are now in service. In 1910, six Mallet articulated locomotives were purchased and fifteen are now owned and in use. The following locomotives have been bought since 1906:

YEAR	NUMBER	TYPE
1907	18	E-5
1908	30	E-5
1910	6	Mallet
1911	4	Mallet
1911	6	Ten-wheel
1911	1	Oil-burning consolidation
1912	12	E-5
1912	3	Mallet
1913	15	E-5
1914	15	E-5
1914	10	Pacific
1915	1	E-6
1917	2	Mallet
1918	20	E-6 (Ordered in 1917)

The E-6 locomotive, shown above, purchased in 1915, was for experimental purposes, and it was in consequence of this experimentation that twenty more of the same character were ordered in 1917 and received during 1918. Commencing in 1911, specifications for new locomotives required that they should be equipped with superheaters. In 1914 the equipment with superheaters of the locomotives purchased prior to the adoption of this policy was begun and prosecuted as rapidly as the engines could be spared from service or as they were shopped for general overhauling. The following authorizations for equipment with superheaters were made and largely completed before the end of the year 1917:

YEAR	NUMBER	TYPE
1914	10	E-5 Locomotives
1915	38	E-5 Locomotives
1915	6	H Locomotives
1915	4	E-3-A Locomotives
1915	4	D-3 Locomotives
1916	12	E-3-A Locomotives
1917	30	E-3 and E-3-A Locomotives

By the end of 1917 this work had resulted in greatly increasing the efficiency of the power equipment, enabling the movement of equal tonnage at materially lower operating cost. The increase in tractive power of locomotives between 1907 and 1917 affords a measure of the augmented efficiency which had been obtained.

YEAR	AVERAGE TRACTIVE POWER OF ALL LOCOMOTIVES IN POUNDS
1907	28,876
1917	38,616
Increase, per cent	33.73

At the beginning of 1907, the number of freight cars in service was 13,783; on December 1, 1917, the number was 18,302, an increase of 32.79 per cent. The mere numbers fail, however, to state the actual increase in car capacity. The increase in the number of cars has been by the addition of larger cars and has been accompanied by the retirement of many cars which were below average capacity and their replacement by cars of greater than average capacity. The average capacity of all freight cars in 1909 was 35.77 net tons, while the average of the year 1917 was 37.69 tons, an increase of 5.37 per cent. In order further to increase the efficiency of freight equipment, a program of substitution of steel underframes for wooden underframes was inaugurated in 1909 with an authorization covering 500 cars. This was followed in 1910 by an authorization of 400 cars; in 1911, 400 were authorized; in 1912, 800, and in 1917, 1,000. On December 1, 1917, there were, as already stated, 18,302 freight cars, of which 8,543, or 46.7 per cent, had steel underframes and 9,888, or 54.0 per cent, had each a capacity of 85,000 pounds or greater.

The principal increase in passenger equipment after 1906 was by the purchase, in 1916, of twenty-four steel passenger cars and three steel mail and baggage cars. In addition a number of baggage and mail cars were equipped with steel underframes. The steel passenger cars added in 1916 are provided with smoking compartments and their use frequently enables a single car of this type to perform services for which two cars of the former type were necessary.

Additional main tracks constructed during the period under review include the following:

Delanson to Schenectady.—A second track, over a new line, was constructed between these points during 1907 and 1908. The location was determined with relation to southbound grades and it is operated as a southbound track, thus materially reducing the grade against southbound traffic between these points and greatly increasing the capacity of the railroad over this distance.

Watervliet to Waterford Junction.—A second track between these points was authorized in 1907 and the work was prosecuted during 1907 and 1908 and finally completed early in 1910. Owing to the heavy passenger traffic between Albany and Saratoga, traffic between these points had formerly been greatly congested and this improvement greatly facilitated operation.

Green Ridge to Carbondale.—Third and fourth tracks between these points were authorized during 1907 and completed in 1909. The frequent passenger service between Scranton and Carbondale and the large volume of coal traffic originating at breakers in this territory had rendered operation with the double-track line extremely difficult. The two added tracks have largely eliminated delays, and enable the railroad to handle increased tonnage between these points.

Binghamton.—A second track, one mile long, was constructed on Bevier Street, in this City during 1911. This permits freight trains to advance out of the Binghamton yard without blocking the main track or interfering with yard operations and has materially augmented efficiency at this point.

Schoharie Junction to Delanson.—As part of a plan of grade revision between these points, a third track became necessary in order to permit slow-moving freight trains to advance without interference with faster moving passenger trains travelling in the same direction. This track was put into service on December 1, 1916, and has materially benefited operation.

Oneonta to Schenevus.—Construction of a third track between these points was authorized in 1917 and a portion between Oneonta and Cooperstown Junction was put in operation during October, 1917. This additional track was also provided for as a part of the general plan for reduction of grades between Oneonta and Richmondville Summit. The ruling grade between the two points last named is now 0.8 per cent; when the plan is complete the maximum grade will be 0.5 per cent. This work was not entirely completed at the end of 1917, but the additional track now enables heavy freight trains from the Oneonta yard to advance a considerable distance without interference with passenger trains and has greatly improved yard operations.

Schenevus to Richmondville Summit.—A third track with a maximum grade of 0.5 per cent between these points is a part of the general plan for grade revision and was partly constructed during 1917.

Nineveh Branch.—A second track on this branch was authorized late in 1917 and construction has continued during 1918. No benefit to operations resulted from this work prior to January 1, 1918. All the heavy coal trains moving out of the Anthracite Region are operated over this branch and the single track heretofore existing was the cause of serious congestion in in the past. The second track was necessary in order to increase the capacity of this portion of the road and thus to remove difficulties which tended to restrict the capacity of the whole system.

The Wilkes-Barre Connecting Railroad Company was organized in 1912, by the joint action of your company and the Pennsylvania Railroad Company for the purpose of establishing a connection between the lines of the respective companies, near Wilkes-Barre. Right of way was acquired and construction commenced during 1913, and the line was opened for operation, although not entirely completed, on March 29, 1915. This line is used to handle traffic which was formerly moved, under trackage rights, over a line owned by the Lehigh Valley Railroad Company and in addition to saving in expenditure, has greatly expedited the movement of trains. The question of grade crossings, which promised to be a very troublesome one, has also been avoided by this construction. Prior to Federal control it was operated by your company under an agreement with the other parties in interest. The cost of the one half interest secured by your company has been $1,131,838.65.

From 1906 to 1917, improvements in yard facilities were made at many points upon the system. The yard at Oneonta was remodeled and enlarged during 1906. At Glenville, N. Y., a new yard was constructed in 1907. The yard at Binghamton was enlarged in 1908. During 1909 new yards were constructed at Bluff Point, N. Y., and Jermyn, Pennsylvania, the latter for use as an interchange yard with the New York, Ontario and Western Railway. The yards at Plattsburg and Rouses Point were enlarged during 1912 and that at Mechanicville was remodeled and enlarged in 1913.

A principal improvement of this character, in progress throughout the years from 1913 to 1917, inclusive, was the reconstruction and enlargement of the yard at Carbondale. This yard is one of the most important facilities in the operation of the Company's railroad as it is located at the concentration point of all northward bound anthracite passing over the lines, and the center of distribution for empty cars returning to the collieries for reloading with coal. Carbondale is located at substantially the extreme north end of the Lackawanna Coal Basin, only one anthracite mining operation, that at Forest City, Pennsylvania, being further north. All but one of the mines of The Delaware and Hudson Company's system are within the region between Plymouth and Carbondale, in the Susquehanna and Lackawanna Valleys, and are well distributed over the intervening distance of about thirty-eight miles. Empty cars, destined to the anthracite mines, are taken out of the Carbondale yard by road engines which deliver them at the breakers and, picking up the cars which have been loaded, return to the yard. In the yard, these loaded cars are sorted and arranged in trains with regard to convenience in delivery at destination and junction points. In addition there is handled in this yard, a considerable tonnage of general freight, other than anthracite, principally consisting of traffic moving in car loads, which is interchanged with the Pennsylvania Railroad at Wilkes-Barre. This yard is also used for handling business of the Erie Railroad from and to anthracite mines in the same region. That company owns the railroad extending northward from Carbondale, which is used by The Delaware and Hudson Company as far as Jefferson Junction, under a long term agreement, and in consideration of the payment of trackage charges. The Erie Railroad has no direct connection with these mines over its own rails and has, therefore, arranged to use The Delaware and Hudson Company's railroad between Carbondale and Avoca, handling thereover a considerable tonnage which passes through Carbondale yard and is there sorted and arranged in trains substantially as this Company's own traffic is handled. This yard was established in 1872 and successively enlarged during 1888, 1893, 1895 and 1899. The growth of the work there accomplished is indicated by the following which shows the average tonnage, during each period, moving northward out of this yard on which this Company has paid trackage charges to the Erie Railroad for use of the Jefferson Branch.

Period.	Average Tons Moved Per Year
Years 1874 to 1879	289,750
Years 1880 to 1889	1,076,164
Years 1890 to 1899	1,975,219
Years 1900 to 1909	4,713,499
Years 1910 to 1917	8,621,985

Previous to 1910 the expansion of this yard had been by the addition of new tracks wherever the topography permitted and there had been, apparently, no well considered plan of development. It was not properly co-ordinated with the balance of the system, its capacity was insufficient and it was not economical in operation. The tracks were too short to hold entire trains. The Erie Railroad had also constructed a yard, of limited capacity, on land leased from this Company and this yard was of inadequate capacity and unsatisfactory design. In these circumstances a study of the situation, locally and as related to the entire operation of the Company's railroad, was undertaken in 1910 and a comprehensive plan, contemplating progressive development over a considerable period and with the minimum interference with regular operations was ultimately formulated and adopted.

The initial step was the reconstruction of the engine terminal in coordination with the general plan for the development of the whole railroad. The old roundhouse, turntable and coal and ash-handling facilities were too small for the motive power contemplated by this development, particularly for the Mallet locomotives intended for use as pushers on the heavy grade immediately north of Carbondale. These Mallet locomotives are ninety-two feet long, while those for which provision had formerly been made were about seventy-three feet long, and the weight of this new power exceeded that of the old by about fifty per cent. This part of the work was authorized in 1910 and completed during 1911. At the time of this authorization, the officers were empowered to purchase the land necessary to the enlargement of the yard and purchases were begun, but the whole area necessary was not immediately obtained owing to difficulties in dealing with certain of the owners and those incident to the elimination of certain grade crossings. A further step in the program, the construction of storage tracks for locomotives, car repair tracks and the rearrangement of water-tanks and water supply lines was completed in 1914. The earliest authorization covering reconstruction of the actual yard itself was granted during October, 1914, and covered the construction of two main tracks beyond the western limits of the yard as it then existed and of certain new tracks within the existing yard. To obtain space for the new tracks it was necessary to level a large section of the hill lying west of the yard and to remove the old yard of the Erie Railroad. The latter was provided for by permitting the Erie to use the new yard upon paying part of the cost of its operation and maintenance. This work was prosecuted throughout the whole of the calendar year 1915. The new tracks were not available for use during that year and the work interfered somewhat with the operation of the old facilities as the material taken from the hill had to be moved southward through the southern end of the yard and about one and one-half miles on the main tracks to "Duffy's Field," where it was planned to erect a new plant for the storage of anthracite. The new coal storage plant at "Duffy's Field" was a part of the general plan of reconstruction. In 1899, a storage plant for coal had been provided on a location just north of the yard as it then existed and east of the Lackawanna River. To straighten the channel of the river in order to permit the lengthening of the yard tracks it was necessary to utilize this space and therefore to remove and reconstruct the storage plant upon another location. Authority to do this was issued in May, 1915, and the work completed during December, 1916. Every effort was made to accomplish this removal with the minimum interference with the use of the plant but a heavy reduction in its capacity during a portion of the time was unavoidable. As an incident of this yard improvement it was necessary to eliminate a grade-crossing by constructing a highway bridge over "Simpson's Road." The final plan of the yard required two additional main tracks across this road for which the consent of the local authorities was required. The highway was occupied by a street railway track and the traffic on both the street railway and on the highway was heavy so that the continuance of the grade-crossing, with additional railway tracks, was considered, by the authorities, exceedingly dangerous. An overhead bridge, to carry the street railway and the highway, was constructed under an agreement by which its cost, together with that of the necessary approaches, was unequally divided by the Scranton Railway Company, and The Delaware and Hudson Company. The portion borne by this Company was properly a part of the cost of the yard improvement. The work was completed and the overhead structure placed in use on December 7, 1917.

The completion of the yard improvements was provided for by an authorization issued during October, 1916, and the final work progressed throughout the whole of the year 1917. The new main tracks were placed in operation in October, 1917, and some of the new yard tracks became available during the preceding summer. Actual benefit did not accrue from these heavy outlays until the new main tracks could be utilized and full use of the improved yard could not be attained during the brief remainder of the calendar year. During December, 1917, however, the new facilities began greatly to facilitate the operation of the property as a whole. The cost of these improvements to the Carbondale yard exceeded $1,500,000.00. Before the work began in 1910, the yard had an approximate length of 5,000 feet and an aggregate capacity of 2,100 cars. The new yard turned over to the Railroad Administration on January 1, 1918, has an extreme length of 7,200 feet and capacity for 3,139 cars, an increase in car capacity of 49.48 per cent. This, however, by no means measures the gain accruing from this expenditure. Not only has nominal capacity been greatly increased, but an uneconomical yard, difficult and costly to operate, has been replaced by one thoroughly modern and efficient in design and arrangement. The relation of the old yard to the railway system was such that its inadequacy was reflected over the entire system; that of the enlarged and improved yard is such that its operation increases the capacity and efficiency of the entire railroad.

The development of the railroad required new locomotive shops. Previous to 1911 heavy repairs to locomotives were distributed between shops at Carbondale, Oneonta and Green Island. With the large increase in the number of locomotives and in the size and weight of the power units these shops became inadequate. It was considered necessary to locate shops of much greater capacity at a single point as near as possible to the center of locomotive distribution. Such shops were erected at Colonie, a short distance north of Albany, during 1911 and 1912. The design of these shops was new and presents many novel features in shop economy. A bay for the transfer of engines by cranes takes the place of the old style transfer-table and is located in the centre of the shop. It has bays on both sides for erecting pits, behind which are bays for machine tools, the light tools being placed in galleries. When first made available for use these shops were considered to be the most advanced and complete of their kind in the country. In order to provide for their erection, the Company acquired 111.87 acres of additional land, of which about 104 acres are occupied by building and track development and the balance available for expansion. The buildings are so located that they may be doubled in size by end extension. The total cost has been $2,592,856.63. The new shops have effected a considerable saving in expense by (1) concentrating this kind of labor under proper and unified supervision and (2) by reducing the time required for repairs and more promptly returning locomotives to service. In connection with this development, the company provided a yard for use in connection with passenger service of the Albany district, including facilities for the repair of passenger and freight cars.

Proper handling of the larger and heavier locomotives, particularly at the ends of runs, has made necessary the replacement of many of the

older enginehouses by structures of greater size; many of the old turntables were too short and of insufficient strength, while ash-pit and coaling facilities, adequate under former conditions, became obsolete. At Oneonta a new roundhouse with fifty-two stalls was built in 1906, together with a 75-foot turntable and a new coaling trestle. In 1912, new ash-pits were built as those in existence were too short and caused serious delay. In 1916 this roundhouse was further enlarged and in 1917 a plant for the storage of locomotive fuel was erected in order to avoid delays in times of coal shortage. Binghamton was provided with a new 10-stall roundhouse, 90-foot turntable, modern ash-pit and mechanical locomotive fuel station in 1910. At Carbondale a new 41-stall roundhouse, a 90-foot turntable, ash-pits and coaling station were provided in 1911. A 30-stall roundhouse, 90-foot turntable, ash-pits and locomotive coaling trestle were built at the Colonie shops in 1911. In 1913, a new 5-stall roundhouse with a 100-foot turntable, ash-pits and mechanical locomotive fueling plant were erected at Mechanicville. All these structures are of the most modern design and capacity sufficient for the longest locomotives.

Motive power of greater capacity of course increased the normal length of trains and passing sidings which sufficed with lighter power were rendered inadequate. Additional sidings of sufficient length for the heaviest trains became necessary in the co-ordination of a railroad of developed capacity. New sidings were constructed at Schenevus, Sidney, Wells Bridge, Bainbridge and Cobleskill in 1909; at Castleton and Cambridge in 1910; at Fort Edward, Summit (two), Fort Ann (two) and Ballston (two) in 1911; at Montcalm Landing, Crown Point, Wadhams and Canada Junction in 1912; at Cobleskill and West Richmondville in 1915. Old sidings were extended during the same years and the year 1916, at East Worcester, Rupert, West Pawlet, Tunnel, Schenevus and East End.

The earliest effort, on a comprehensive scale, to obtain more favorable grades, was the reduction of the grades against north-bound traffic between Nineveh and Oneonta. This was accomplished in 1911 with the result that the former maximum of 0.76 per cent was replaced by a maximum of 0.3 per cent. With this reduction it became possible to move full trains from Carbondale to Oneonta without, in any way, breaking the load and for one locomotive to haul from the summit north of Carbondale to the end of the division any train which can be taken to the summit by a single locomotive reinforced by a Mallet pusher. Work was next undertaken upon the line between Oneonta and Delanson, the ultimate object in view being the attainment of a maximum of 0.5. It was practicable, however, to adjust the program in such a way as to obtain, as a preliminary step, a maximum of 0.8. The adverse grades formerly encountered ran as high as 1.16 per cent. This work was in progress during 1916, the work of that year including the sections between Worcester and Richmondville Summit, Cobleskill and Barnerville and Schoharie Junction and Delanson. These portions of the improvement became available for service on December 1, 1916, and have resulted in considerable economies since that date. The completion of this work so as to obtain the 0.5 per cent maximum, in accordance with a plan developed after a great deal of study, was authorized in 1917. It will require revisions of grades on the sections between Oneonta and Schenevus and Cobleskill and Barnerville and the construction of a new line on an entirely new location from Schenevus. During 1917, part of the work between Oneonta and Schenevus was accomplished and the new line from Schenevus to Richmondville Summit was placed under construction but not completed. With the completion of this phase of the work, the tonnage capacity of locomotives on the Susquehanna Division will be materially augmented, thus considerably reducing operating expenses. With the maximum of 0.5 attained it will be possible to haul trains of the maximum tonnage from Oneonta to Schenectady with the use of a pusher locomotive between Schoharie Junction and Esperance only.

The grade revisions referred to are all upon the Susquehanna Division which extends from Binghamton to Albany and Mechanicville. This is the area of greatest traffic density for the railroad as it is traversed not only by the greater portion of the anthracite shipments originating at the mines adjacent to its tracks and the bituminous coal and general merchandise traffic interchanged with the Pennsylvania Railroad and Central Railroad of New Jersey at Wilkes-Barre, but also by heavy general merchandise and bituminous coal traffic interchanged with the Erie and Lackawanna railroads at Binghamton, and with the Lehigh Valley at Owego. This combined tonnage is moved to Oneonta on through trains either from Binghamton or from the Pennsylvania Division via Nineveh. At Oneonta the traffic is sorted and moved northward, through Delanson, to Albany or Mechanicville or through Saratoga into Canada. Local business, while considerable, constitutes a relatively small proportion of the total tonnage and under normal conditions the northbound business greatly exceeds that moving southward. Consequently there is a heavy southward movement of empty cars, the preponderating portion of the anthracite cars going back to the coal region without loads. Except under extraordinary conditions the greater part of the power moving toward the south is not loaded to capacity. The line between Oneonta and Delanson was built as a single-track road in 1865 and, in conformity with the custom and necessities of that period, was located with regard to economy in capital expenditures rather than to the economies in operation which might have been gained with a greater first cost and more attention to securing a low-grade line. Later this was made a double track line but without relocation or reduction of grades. Oneonta lies in the valley of the Susquehanna River and to reach Delanson it is necessary to cross two water sheds, first, that separating the Susquehanna and Schoharie Valleys, next that dividing the latter from the valley of the Hudson River. Exhaustive studies of the topography and possibilities of this region were necessary before actual work was undertaken.

On June 30, 1913, an agreement was made with the City of Albany in pursuance of which the company's terminal facilities in that city for both passengers and freight have been greatly enlarged and improved and a new office building and freight terminal obtained. This contract was the result of long consideration and represented the desire of the municipality to improve the appearance of the water-front and the lower portion of State Street, as well as the wish of the company to obtain enlarged facilities. Prior to these changes the operation of the property was hampered by grade crossings, inadequate trackage, badly located freight terminals and insufficient office room under its own ownership. Not only have these defects been remedied by the improvements, but provision has also been made for further expansion to meet additional requirements of the future.

It is necessary to understand that all the foregoing improvements were related from the beginning and that the full benefit of none could have been obtained until all were completed. The problem was to increase freight-train efficiency. This involved, primarily, better grades, locomotives of greater tractive power and larger cars. Larger locomotives required better road bed and stronger bridges as well as larger roundhouses, turntables and ash-pits. Longer trains, made possible by better grades and more powerful engines, required larger and more capacious terminal and assorting yards, longer passing tracks and more second and third tracks. New and additional power and cars required new shops. All these changes and improvements had to be balanced and co-ordinated so that the completed property would function efficiently as an entity. It was a real process of construction and development resulting in the creation of a property, turned over to Federal control at the end of December, 1917, which was of much greater capacity and entirely different from that which was operated during the period of development.

FEDERAL CONTROL.

To the end of May, 1918, the railway properties under Federal control were operated through their managing boards and the officers selected by these boards or directly by the owners. At the beginning of June, however, the Director General, without assigning any definite reasons therefor, relieved the corporate managers and officers of these responsibilities and appointed "Federal Managers," who were required to separate themselves wholly from relations with the owning and formerly operating corporations. Your former Vice-President and General Manager, Mr. F. P. Gutelius, was designated as the Federal Manager of your railway and its affiliated railway and boat lines in the United States, and immediately ceased to be an officer of your corporation and its subsidiary corporations. Coincident with this change, a complete separation of the railway and corporate managements was required involving a rigid classification of the personnel and in some instances the distribution of duties formerly performed by single officers. No comment upon the wisdom of these requirements is made or intended. It must be noted, however, that it adds another to the problems of readjustment, the solution of which must accompany or precede the restoration of the properties to their owners.

The act of March 21, 1918, under which the railways are now operated, permits Federal control for no longer than one year and nine months after the "proclamation by the President of the exchange of ratifications of the treaty of peace." Notwithstanding certain efforts to prolong the period, and an apparent desire on the part of a numerically slight section of the public to utilize the emergency action, in violation of solemn pledges at the time it was taken, as a means to permanent ownership by the Government, it is plain that the great majority of the public desires as prompt return as possible to normal methods and conditions. This is especially true of those who, as travellers and shippers, have most frequent occasion to require railway services. The discussion of the legislative changes which should accompany the return of the properties to their owners, is now in progress, many and varied programs have been suggested, and within a short time the consideration of measures is likely to become detailed and definite. Intelligent discussion of these problems ought to proceed from initial recognition that the solitary basis of necessity for the radical action of December, 1917, was the destructive character of the regulative measures and methods that had accumulated, rather than developed, up to that time. It was the financial weakness of the carrier corporations caused thereby that in the face of a great national emergency impelled toward the proclamation of December 26, 1917. On the side of financial resources the regulative measures had left no margin of safety. Independent and conflicting authorities, none of them with definite or recognized responsibility for obtaining an equation between required expenses and permitted income, had regulated expenses (chiefly but not by any means wholly those reflecting rates of wages), upward, while rates of fare and freight were regulated in the opposite direction or held nominally stationary while the medium of payment was rapidly declining in purchasing power. Prior to the war these conditions had induced sporadic disasters, in other cases they had merely threatened; but with the enormous inflation of the war period and with the sudden pressure upon the reduced supply of labor and resultant high wages, the situation became unworkable and impossible. The only relief lay in the direction of a prompt adjustment of rate schedules to the new conditions and between such an adjustment and the corporate managers the machinery of regulation seemed to interpose as an insurmountable obstacle. By means of Federal possession, the President conceived that an adequate adjustment of rates could be obtained without excessive delay and that, pending such adjustment, the inevitable losses of operation could be, in the main, shifted to the public treasury. If the former could have been accomplished without Federal possession, the latter would have been unnecessary.

The problem is the elimination of the conditions of which this weakness in face of emergency was the inevitable result. The mere form of the regulative system determined upon is of minor consequence. The essentials are that it should be complete and systematized, prompt and sympathetic. If rates of wages are to be controlled by public authority, in consideration of the obligation of employees as well as owners not to interrupt the public services rendered by the facilities they operate, it is necessary that there should be co-ordination between the regulation of wages and the regulation of rates. Otherwise, the carriers are not unlikely to be required to pay wages in amounts in excess of any income available for that purpose, in effect out of capital, with the early result of impairment of service and the ultimate consequence, if uncorrected, of its discontinuance. There have, in recent years, been many instances in which one public or *quasi*-public authority has coupled with a direction to increase wages the declaration that to meet the added expenses there must be compensatory changes in rates, only to have the proposed compensation refused by a second authority actually constituted by the same public—that is deriving its powers from the same source.

Railways and all public service enterprises are now required to operate for moderate returns to their owners and these returns secured by but narrow margins of safety. Such has been the public attitude in the more recent past, where it has not appeared to be even less favorable, and there is no evidence of a change of temper in this respect. If this attitude is not to be fatal to private management the rectification of conditions that would destroy the margin between solvency and insolvency must be immediate, the remedy must always be applied before the margin has been absorbed. This implies a degree of rapidity in the processes of regulation which the past has shown them not to possess. Railways and other public service enterprises have been compelled to wait for justice until action which, if promptly taken, would have sufficed, has become wholly insufficient. The correction of this defect is among the plainest necessities of the situation. Moreover, regulation to be consistent with the public interest must be applied in the light of sympathetic realization of the problems and needs of the industry. The scales of justice must be held in balance without partiality to the purchasers of transportation and with adequate comprehension that, in the long run, the interests of those who desire transportation services and those who are equipped to render such services are identical. Economic efficiency reposes in ability and intention to create and dispose of some commodity or service on terms which afford a just profit to both parties to each transaction, the seller and the buyer. If either the railways or the purchasers of railway services fall below this standard the condition must speedily be corrected or the whole industrial fabric will be unfavorably affected.

By order of the Board of Managers,

L. F. LOREE,
President.

[Adv.]

Railway Officers

Railroad Administration

Regional

Horace Epes, of the Washington office of the Associated Press, has been appointed special assistant to **B. L. Winchell,** regional director of the Southern region, with office at Atlanta, Ga.

Federal and General Managers

K. B. Conger, general manager of the Hudson & Manhattan, has been appointed federal manager, with headquarters at New York.

W. H. Edmondson has been appointed assistant to the federal manager of the Grand Trunk, Western Lines, with headquarters at Detroit, Mich.

J. P. Main, assistant to the federal manager of the Ann Arbor and the Detroit & Toledo Shore Line, with headquarters at Detroit, Mich., has been appointed assistant to the federal manager of the latter line and the Toledo, St. Louis & Western, with headquarters at Toledo, Ohio.

Alfred M. Darlow, whose appointment as federal manager of the Buffalo & Susquehanna, with headquarters at Wellsville, N. Y., has already been announced in these columns, was born on November 29, 1884, at St. Louis, Mo. He began railway work in June, 1902, as a rodman on the Vandalia Railroad, and later went to college. He graduated from Cornell University with the degree of M. E. in 1906, and the same year entered the service of the Chicago & Eastern Illinois as a special apprentice at the Danville (Ill.) shops. In 1909 he was made roundhouse foreman and served at Dolton and at Danville, on the same road. He was appointed mechanical engineer of the Buffalo & Susquehanna, at Galeton, Pa., in 1911, and later assumed also the duties of general storekeeper. From 1912 to 1916 he was superintendent of motive power at Galeton in charge of stores and mechanical departments, and then, to 1918, served as assistant to president and superintendent of motive power in charge of operation. On June 13, 1918, he was appointed general manager under the United States Railroad Administration, which position he held until his promotion, on April 7, as federal manager of the same road, as above noted.

A. M. Darlow

Operating

T. H. Hervey has been appointed superintendent of car service of the Ann Arbor Railroad, with headquarters at Toledo, Ohio.

F. Schaefer, district freight agent of the San Francisco & Portland Steamship lines, with headquarters at San Francisco, Cal., has been promoted to manager, with the same headquarters, succeeding **G. L. Blair,** general manager, deceased.

H. M. Williams, recently discharged from the army, has been appointed terminal superintendent for the New York, Chicago & St. Louis, with headquarters at Chicago. **Ogden Pierce,** acting terminal superintendent, has been appointed terminal trainmaster, with the same headquarters. **E. S. Kirby,** acting terminal trainmaster, has been assigned to other duties.

R. B. White, superintendent of the Philadelphia division of the Baltimore & Ohio, with office at Philadelphia, Pa., has been appointed superintendent of the Baltimore division, with headquarters at Baltimore Md. On May 1 the Philadelphia and Baltimore divisions, exclusive of the Baltimore Terminal division, were consolidated and are now known as the Baltimore division.

William C. Bevington, whose appointment as superintendent of the Joplin division of the Missouri Pacific, with headquarters at Nevada, Mo., was announced in the *Railway Age* of April 18, was born in New Lenox, Ill., in 1868, and received his education in the high school of that city. He entered railway service in 1885 with the Chicago & North Western as operator, since which he was consecutively, until 1897, despatcher, chief despatcher and terminal trainmaster. The following two years he was in the employ of the Union Pacific, and from 1899 until 1905 he served on the Chicago, Rock Island & Pacific as despatcher, chief despatcher and trainmaster on the Kansas and Colorado divisions. From the latter date to 1907, he was in the employ of the Chicago, Burlington & Quincy as assistant chief despatcher and chief despatcher, resigning from that road to enter the employ of the Missouri Pacific as chief despatcher, which position he held until 1911, when he was promoted to trainmaster of the Joplin division, with headquarters at Nevada, Mo., in which capacity he served until his recent appointment.

W. C. Bevington

Financial, Legal and Accounting

The following appointments have been announced by **E. F. Blomeyer,** federal manager of the Ann Arbor Railroad, effective May 1: **Joseph Goldbaum,** auditor, has been appointed federal auditor, and Alexander L. Smith, general attorney, has been appointed general solicitor; both with offices at Toledo, Ohio.

B. C. Stevenson, who was appointed federal manager of the Toledo, St. Louis & Western and the Detroit & Toledo Shore Line, as announced in the *Railway Age* of May 2, has made the following appointments: **W. A. Eversman** becomes solicitor, with headquarters at Toledo; **L. T. Williams** becomes assistant general solicitor, with headquarters at Toledo; **R. Larmer,** assistant auditor of the Toledo, St. Louis & Western, with headquarters at Toledo, becomes federal auditor, with the same headquarters; **G. S. Ross,** assistant federal treasurer of the Toledo, St. Louis & Western, with headquarters at Toledo, becomes federal treasurer, with the same headquarters.

The following appointments have been made on the Grand Trunk, Western Lines, following the appointment of **H. E. Wittenberger** as federal manager: **W. K. Williams,** general attorney of the Grand Trunk, Western Lines, with headquarters at Detroit, Mich., has been made general solicitor, with the same headquarters; **N. C. Foss,** purchasing agent of the Ann Arbor, with headquarters at Toledo, Ohio, has been made purchasing agent of the Grand Trunk, with headquarters at Detroit; **William A. Geer** has been appointed general attorney, with headquarters at Detroit; **E. J. Cooper** has been made general claim agent, with headquarters at Detroit;

L. R. Flanders becomes freight claim agent, with headquarters at Detroit; **J. O. Talbott,** federal auditor of the Grand Trunk, Western Lines, and the Pere Marquette, with headquarters at Detroit, has been appointed federal auditor of the Grand Trunk, with the same headquarters; **J. L. Cramer,** federal treasurer of the Grand Trunk, Western Lines, and the Pere Marquette, with headquarters at Detroit, has been appointed to be federal treasurer of the Grand Trunk, with the same headquarters.

Traffic

H. S. Bradley has been appointed traffic manager of the Ann Arbor Railroad, with office at Toledo, Ohio.

F. S. Ross has been appointed general freight agent of the Detroit & Toledo Shore Line, with headquarters at Detroit, Mich.

C. E. Rose, assistant general passenger agent of the Toledo, St. Louis & Western, with headquarters at Toledo, Ohio, has been promoted to general passenger agent with the same headquarters.

G. J. Vizard, heretofore assistant general freight agent of the Erie, with headquarters at Chicago, has been appointed manager of the traffic bureau of the Little Rock (Ark.) Board of Commerce.

The jurisdiction of **R. R. Mitchell,** general freight agent; **S. G. Warner,** general passenger agent; **H. A. Weaver** and **J. R. Mills,** assistant general freight agents, and **F. D. Downie,** general baggage agent has been withdrawn from the Midland Valley, the Kansas City, Mexico & Orient and the Missouri & North Arkansas. **Eugene Mock** of the St. Louis (Mo.) District Freight Traffic Committee has been appointed general freight and passenger agent of the Midland Valley with headquarters at Muskogee, Okla. **E. H. Shaufler,** general freight agent of the Kansas City, Mexico & Orient has been promoted to general freight and passenger agent with headquarters at Wichita, Kan. **C. E. Veatch** has been appointed general freight and passenger agent of the Missouri & North Arkansas with headquarters at Harrison, Ark. **Percy Talbot,** acting division freight and passenger agent of the Midland Valley at Muskogee, has been promoted to division freight and passenger agent with headquarters at Tulsa, Okla. **J. R. Holcomb** has been appointed division freight and passenger agent of the Kansas City, Mexico & Orient with headquarters at San Angelo, Tex.

Engineering and Rolling Stock

F. R. Ramsey, engineer maintenance of way of the Toledo, St. Louis & Western, with headquarters at Frankfort, Ind., has been promoted to chief engineer, with the same headquarters.

C. E. Allen, general master mechanic of the Northern Pacific, at Livingston, Mont., has been appointed general master mechanic of the lines east of Mandan, N. D., with headquarters at St. Paul, Minn., vice **T. J. Cutler,** transferred.

A. M. Traugott, division engineer of the Virginian Railroad, with office at Princeton, W. Va., has been appointed acting chief engineer, with office at Norfolk, Va., vice **F. L. Nicholson,** who is resuming full service with the Norfolk Southern Railroad.

R. B. Robinson, whose appointment as engineer maintenance of way of the Union Pacific, with headquarters at Omaha, Neb., was announced in the *Railway Age* of May 2, began railway work with the Union Pacific, with which road he served in various minor engineering positions for six years. For the past 15 years he has been in the employment of the Oregon Short Line in various engineering positions leading up to that of engineer maintenance of way in which capacity he served until his recent promotion.

J. O'Connor, special roadmaster of the Minneapolis, St. Paul & Sault Ste. Marie with headquarters at Minneapolis, Minn., has been appointed general roadmaster of this road, the Duluth, South Shore & Atlantic and the Mineral Range with the same headquarters. The position of special roadmaster has been abolished. **J. B. Kelly,** roadmaster on the Minneapolis, St. Paul & Sault Ste. Marie with headquarters at Minneapolis, Minn., has been promoted to assistant general roadmaster with the same headquarters. **H. P. Stafford,** general roadmaster of the Duluth, South Shore & Atlantic with headquarters at Marquette, Mich., has been promoted to assistant general roadmaster of this road and the Mineral Range with same headquarters.

J. W. Oplinger, superintendent of motive power of the second and third divisions of the Atlantic Coast Line, with headquarters at Waycross, Ga., resigned, effective, May 1. He entered the service of the Central of New Jersey on March 1, 1874, as a machinist apprentice and after completing his apprenticeship in 1878, served as a machinist until 1880 on the same road. He then went to the Lehigh Valley as a machinist at Wilkes-Barre, Pa., and four years later left that road to go to the Atchison, Topeka & Santa Fe, in New Mexico, remaining in the service of that road until 1887. He then returned to the Central of New Jersey as gang foreman, and later was erecting foreman on that road. In 1894 he served as general foreman on the New York, Susquehanna & Western, and in 1900 was appointed master mechanic on the Atlantic Coast Line. Four years later he was promoted to superintendent of motive power of the second and third divisions, with office at Savannah, Ga., and since 1910 at Waycross, Ga., from which position he now resigns to retire to his farm in Pennsylvania.

Purchasing

C. Z. Hughes has been appointed purchasing agent of the Ann Arbor Railroad, with office at Toledo, Ohio.

Dwight C. Curtis, inspector of stores on the Chicago, Burlington & Quincy, with headquarters at Chicago, has been promoted to supervisor of stores of the Northwestern region, with the same headquarters, succeeding **J. E. Mahaney,** resigned to accept service elsewhere.

Corporate

Executive, Financial, Legal and Accounting

J. F. Aitchison, acting auditor of disbursements on the Grand Trunk and the Grand Trunk Pacific, has been appointed auditor of disbursements, with headquarters at Montreal, Que., and the title of acting auditor of disbursements has been abolished.

Operating

W. C. Ramsay, auditor of the Dayton, Toledo & Chicago Railway Company, has been appointed assistant general manager, with headquarters at Dayton, Ohio.

W. E. Brown, general manager of the Dayton, Toledo & Chicago Railway Company, with headquarters at Dayton, Ohio, has been appointed general manager also of the Oklahoma, New Mexico & Pacific Railway Company, with headquarters at Ardmore, Okla.

Traffic

W. G. Roche has been appointed general agent of the freight department of the Canadian Pacific Ocean Services, Limited, with office at Chicago, and **J. R. Clancy** has been appointed general agent of the freight department for Ontario, with office at Toronto, Ont.

H. L. Blackstone, general agent of the Sacramento Northern, with headquarters at San Francisco, Cal., has been promoted to assistant general freight agent, with headquarters at Sacramento, Cal. He was born in Shullsburg, Wis., in 1875, and entered railway service in 1899 with the Chicago, Milwaukee & St. Paul. In the same year he entered the employ of the Great Northern as traveling freight agent, at Butte, Mont. He remained in this position until 1904, when he was appointed agent, with headquarters at Fernie, B. C. From 1909 to 1914 he was in the employ of the Western Pacific as traveling freight agent at San Francisco, Cal., remaining with that road for five years and then entering the employ of the Sacramento Northern as general agent at San Francisco, in which capacity he served until his recent promotion.